CALGARY RIVER VALLEYS PLAN

LAND USE INVENTORY AND ANALYSIS - DRAFT

SUPPORTING INFORMATION
TO
'THE PLAN AND POLICIES'

THE CITY OF CALGARY
PLANNING DEPARTMENT

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A THE BOW RIVER

A1 LAND USE INVENTORY

A1.1 BOWNESS

(The right bank between 85th Street Bridge and 24th Avenue alignment, N.W.)

A1.1.1 Residential Houses

Most of the houses close to the Bow River are single-family structures of a variety of ages and sizes. The communities of Bowness and Montgomery together are a R.R.A.P. (Residential Rehabilitation Assistance Program) area. About 157 properties are less than 60 m (200 ft.) outside the floodway limit and about 118 of these are from 3 m (10 ft.) outside of, to entirely within the floodway. Approximately 115 have ownership to the waterline. The houses are broken into three groupings, as follows.

There are about 110 properties located between the 48th Avenue N.W. alignment and 85th Street N.W., where the floodway limit approximates the waterline. The houses are from approximately 12 to 215 m (40 to 700 ft.) from the waterline. Thirteen properties extend to the waterline and the rest are 10 to 180 m (30 to 600 ft.) away from the waterline. West of the CPR right-of-way about 12 properties are partly within the floodplain and east of it all the properties are completely within the floodplain.

There are about 108 properties situated between Shouldice Bridge and the 48th Avenue N.W. alignment. The houses are 12 to 150 m (40 to 500 ft.) away from the waterline, but 15 are wholly or partly inside of the floodway; the rest being from about 3 to 60 m (10 to 200 ft.) away from the floodway limit. All but about 18 properties are completely within the floodplain.

On Bowmont Crescent there are four houses and two duplexes located about 30 to 45 m (100 to 150 ft.) from the waterline, which is also the floodway and floodplain limit. The property lines range from about 15 to 45 m (50 to 150 ft.) from the waterline.

A1.1.2 Multiple-Family Housing

There is a relatively new row-housing development of about 20 units at the corner of 48th Avenue N.W. and 85th Street N.W. The units vary from 25 to 70 m (75 to 225 ft.) from the waterline, which is also the floodway limit. The property line extends to the waterline and is about 30 m (100 ft.) inside the floodplain.

There are two new row-housing developments (1975 to 1977) between 31st Avenue N.W. and the Trans-Canada Highway. Those units in the developments facing the river are about 60 to 90 m (200 to 300 ft.) away from the waterline which is also the approximate floodway limit. The property lines come within 60 m of the waterline. The eastern development is mostly outside of the floodplain limit and the western development is completely outside.

A1.1.3 Commercial

There is an informal farmers market which is located partly on City land and partly on German-Canadian Club land just west of Shouldice Bridge. The movable structures are about 15 to 45 m (50 to 150 ft.) away from the waterline and the floodway limit, which are almost the same here. The market is completely inside the floodplain limit.

The "German-Canadian Club" is just west of Shouldice Bridge and has ownership to the waterline, which is the floodway limit in this case. The building is about 25 m (80 ft.) from the waterline. Various small commercial concerns on Bowness Road east of 62nd Street N.W. are within the floodplain.

A1.1.4 Industrial

The CPR mainline crosses the river at about the 77th Street N.W. alignment; the track being above the floodway limit. Due to fencing, there is no pedestrian access along the bank past this point.

The CPR mainline right-of-way converges with the riverbank at the southern end of the community. The tracks are above the floodway and floodplain limits.

A1.1.5 Institutional

The Bowcrest Nursing Home is located on the north side of 32nd Avenue N.W. by the Bowness Road. It is entirely within the floodplain.

A1.1.6 Established Parks and General Open Space

Due to the large amount of private ownership of the riverbank in Bowness, there is no continuous riverbank open space system, but rather small incontiguous pieces of open space. Unless otherwise noted, these open spaces are inside of the floodplain limit but outside the floodway limit.

"Bowness Park" is an established City park on an island extending upstream of the 81st Street N.W. alignment. It has heavily treed areas and open, recreation-oriented parts. The main entrance is on 48th Avenue N.W. at 87th Street N.W. There are facilities for both active and passive recreation: skating, cross-country skiing, walking, picnicking, etc.

There is a small, City-owned, neighbourhood park of about two acres located along the riverside between the 81st and 83rd Street N.W. alignments. It has planted grass with a red shale pathway with connection to 48th Avenue N.W. Another small, City-owned, neighbourhood park is located between 48th Avenue N.W. and the river and between the 80th and 81st Street N.W. alignments. It is also a grassed area and has a red shale pathway. Active play can take place in both areas.

A small community reserve between the new Bow Green Crescent subdivision and the river has been recently landscaped as a park and is accessible to the public from 48th Avenue N.W.

Another community reserve of about two hectares (four acres) is between the Bow Village Crescent subdivision (presently under development) and the river. Presently it has a fairly natural vegetation and public access is to be provided for.

There is a right-of-way about 3 m (10 ft.) wide between three new lots and the river at Bow Crescent near the 71st Street N.W. alignment, but there is no public access to it.

There is a City-owned playground between Bow Crescent and the river at 66th Street N.W. It has some standard active play facilities.

There is an area of land inside of the floodway limit which has been created by natural accretion along the riverbank between the 60th and 63rd Street N.W. alignments. It is privately-owned and there is no public access.

Two separate single lots have been bought by the City between Bowbank Crescent and the river as a part of their floodway policy - these being inside the floodway limit. One has a house and the other is a vacant lot.

There is a small City-owned semi-natural area on the southeast corner of Bowness Road and Bow Crescent which allows public access to the river. It has planted trees and grass and appears neglected.

There is a small community reserve of about one acre between Bowmont Crescent and the river which is dedicated to the City and is outside the floodway and floodplain limits.

A triangular piece of City-owned land about 3 ha (8 acres) in area is situated between the CPR mainline, the Trans-Canada Highway, and the river. It is vacant with semi-natural vegetation (i.e., planted trees and grass that have been neglected) and is outside both the floodway and floodplain limits. Public access on foot only is possible.

Active play and sports can take place on the two neighbourhood parks and the playground described below: they are grassed and have some active play facilities. Recreational activities such as walking, jogging and cross-country skiing are possible in all of the areas described below aside from the isolated right-of-way, and the privatelyowned recently created area, and the two City-owned lots.

A1.1.7 Public Access

Vehicular access is possible to within 10 to 30 m (25 to 100 ft.) of the river along Memorial Drive.

Pedestrian access to and along the riverbank is provided for along the entire length of the community's frontage on the river.

A1.2 WILDWOOD AND EDWORTHY PARK

(Right bank between 24th Avenue alignment and 37th Street alignment S.W.)

A1.2.1 Residential

There are only three houses in the area whose property lines come close to the floodway limit. These are three, large single-family houses between Sarcee Trail and the river. The property lines extend to the CPR right-of-way, about 60 m (200 ft.) from the waterline, which is also the floodway and floodplain limit.

No other residential or other private property comes within about 90 m (300 ft.) of the floodway although about 34 properties extend to the top of the escarpment.

A1.2.2 Industrial

The 60 m (200 ft.) wide CPR mainline right-of-way - with single and double trackage - is parallel to and abutting the waterline except for the length of the floodplain portion of Edworthy Park.

A1.2.3 Established Parks and General Open Space

"Edworthy Park" is an established, City-owned park covering about 65 ha (165 acres). It is described in Calgary's Natural Areas, which divides it into four areas: floodplain, north-facing slope, ravine, and plateau. Most of the facilities are in the floodplain area (between the foot of the escarpment and the river): playground equipment, picnic tables and shelters, firepits, skating rink and shelter, and parking areas and washroom facilities. Informal sports can take place on parts of the floodplain of Edworthy Park and active play is possible throughout most of the Park. There is a red shale pathway along the riverbank in Edworthy Park.

Activities such as walking, jogging, and cross-country skiing take place in most of Edworthy Park and the 'Douglas Fir Trail' Area. The Douglas Fir Trail passes through a natural area which extends eastwards from Edworthy Park on the City-owned river escarpment. It is described in Calgary's Natural Areas. It is a steeply-sloping area covered with a Douglas Fir and White Spruce forest and is separated from the river by the CPR track dyke. Trails are the only facilities provided.

A1.2.4 Public Access

Vehicular access to within 180 m (600 ft.) of the river at floodplain level is possible via the gravel access road from Spruce Drive to the parking areas at the CPR tracks in Edworthy Park. Vehicular access to within 200 m (700 ft.) of the river at the top of the escarpment is possible along Wildwood Drive.

Pedestrian access is possible down the escarpment to the river via the numerous trails, the park access road, and the Park's toboggan run.

A1.3 SPRUCE CLIFF AND LOWERY GARDENS

(The right bank between the 37th and 24th Streets S.W. alignments)

A1.3.1 Residential

There are no residential property lines within 200 m of the river, although several extend to the top of the escarpment.

A1.3.2 Established Parks and General Open Space

The "Douglas Fir Escarpment" is a natural area which extends along the entire river frontage of this area. It is described in Calgary's Natural Areas. It is steep with a dominant vegetation of Douglas Fir and White Spruce. It is separated from the river by the CPR track dyke and Lowery Gardens.

"Lowery Gardens" is an area of low lying land situated at the foot of the escarpment. It consists of about 42 acres of Provincially-owned land. It is between the CPR right-of-way and the river and extends from the 33rd to 26th Streets S.W. alignments. It is also described in Calgary's Natural Areas. Parts of it are naturally-forested areas; others are disturbed by abandoned gravel pits and land fill. There are no facilities aside from a red shale pathway along the riverbank and a gravelled vehicle track. Vehicular access is from the east but is closed by a gate. Active play is possible in parts of the gardens. A gravel track and red shale pathway allow cycling.

Shaganappi Slopes and the "Shaganappi Golf Course" are City-owned areas above and on the escarpment. On the slopes near the 26th Street S.W. alignment is the "Shaganappi Ski Centre", which has a "T-Bar" ski tow. Vehicle access is via 26th Street S.W. from Bow Trail.

Activities such as walking, jogging, and cross-country skiing can take place in all of the above areas, except for the Golf Course in the summer.

A1.3.3 Public Access

Vehicular access to Lowery Gardens is via the westerly gravel extension of 9th Avenue S.W. between the CPR track and the river. This road is closed by a gate at the 24th Street S.W. alignment. Access is possible also to the top of the escarpment on 24th, 26th, and 37th Streets S.W. and on Spruce Drive.

Pedestrian access to Lowery Gardens is possible from the west along the Douglas Fir Trail, the south down trails on the escarpment, and the east via the 9th Avenue S.W. gravel road. Access to the river in Lowery Gardens is possible at any point.

A1.4 SUNALTA

(The right bank between the 24th Street Alignment and Mewata Bridge S.W.)

NOTE: The floodway is approximately equivalent to the waterline along this part of the river due to the high banks. The floodplain limit is about 30 m (100 ft.) away from the waterline and it does not encroach onto any private property.

A1.4.1 Residential

There are no residential properties within 250 m (800 ft.) of the river.

A1.4.2 Commercial

A one to two-storey block building is located on 10th Avenue S.W. near the 24th Street alignment. It is a fairly new structure with several tenants. Both the building and its property line are about 75 m (250 ft.) from the waterline.

Just east of the above-mentioned development is a one-storey and a two-storey block building used by "Oberg Industries". The building closest to the river is about 85 m (275 ft.) and the property line is about 75 m (250 ft.) from the waterline.

Immediately east of the above buildings is a one-storey block building used by "Bapco Paints". The building and property line are approximately 90 m (300 ft.) from the waterline.

"Universal Sales and Service" is a new car dealership situated between Bow Trail and the river and between the 18th and 20th Street S.W. alignments. It consists of a one-storey building and about 3 ha (7 acres) of asphalt display area. The building is about 100 m (350 ft.) and the property line is about 45 to 100 m (150 to 350 ft.) away from the waterline.

"General Supplies Ltd." is another car dealership located between the two Bow Trails and between about the 16th and 18th Street S.W. alignments. It consists of a two-storey building and about 3 ha (8 acres) of asphalt display area. The building is about 105 m (350 ft.) and the property line is about 45 to 105 m (150 to 350 ft.) away from the waterline.

There is a large two-storey warehouse between the two Bow Trail roadways at about the 16th Street S.W. alignment, which is approximately 60 m (200 ft.) from the waterline. The property line is about 25 m (75 ft.) from the waterline and about 8 m (25 ft.) from the waterline and about 8 m (25 ft.) outside the floodplain.

Another large two-storey warehouse with several tenants is Cityowned and is located between the two lanes of Bow Trail at the 15th Street S.W. alignment. The building is about 25 m (75 ft.) from the waterline and about 8 m (25 ft.) from the floodplain.

In addition, there is a cluster of a few old, small sheds at the western end of 10th Avenue S.W. These sheds and the property line are about 60 m (200 ft.) from the waterline and approximately 25 m (75 ft.) from the floodplain.

A1.4.3 Industrial

The CPR mainline right-of-way abuts the waterline at the 24th Street S.W. alignment but diverges from the river to the east, reaching about 175 m (900 ft.) away by the 20th Street S.W. alignment. It generallhas two or three tracks.

The "Alberta Rapeseed Oil Co., Ltd." has a group of 10 to 12 m (30 to 40 ft.) tall silo structures within the CPR right-of-way at the 21st Street S.W. alignment.

A1.4.4 Institutional

The "Pumphouse Theatre" building is a City-owned former pumphouse which has recently been renovated and expanded for use as a theatre and fair building. It is located between 9th Avenue S.W. and the river at the 20th Street S.W. alignment at the east end of a large open space. The building is approximately 105 m (350 ft.) from the waterline.

A1.4.5 Established Parks and General Open Space

There is a small, isolated piece of City-owned vacant land of less than one acre situated under the south end of the Crowchild Bridge. It is barren of vegetation and marks the western end of a red shale pathway.

A large, approximately 4 ha (11 acre) piece of City-owned open space is located between 9th Avenue S.W. and the river extending from the Bridge to the 20th Street S.W. alignment. It includes a grasscovered hillock, rows of large trees, and the Pumphouse Theatre with its grassed yard. It is in a relatively inaccessible location with respect to pedestrian access. The Parks Department has plans for improving the facilities here.

There is a 1 ha (2.5 acre) City snow dump north of 9th Avenue S.W. just east of the Pumphouse. It extends to about 30 m (100 ft.) from the waterline and in the summer is vacant land. Active play is possible in the open space to the west of the Pumphouse.

There is a stretch of City-owned open space about 30 to 60 m (100 to 200 ft.) wide along the river between the 17th and 20th Street S.W. alignments. It has generally natural vegetation and a red shale pathway is provided. It is mostly within the floodplain limit.

The stretch of open space between Bow Trail and the river from the 17th Street S.W. alignment to Mewata Bridge is only about 5 m (20 ft.) wide - with only about two metres of pathway space. It is within the Bow Trail right-of-way and inside the floodplain limit.

A1.4.6 Recreational Land

Activities such as walking, jogging, and cross-country skiing are possible in all of the areas described. The red shale pathway along this length of the riverbank makes cycling possible.

A1.4.7 Public Access

Vehicular access along the riverbank between Mewata Bridge and the 18th Street S.W. alignment is along the major westbound Bow Trail, but no stopping is possible. It is one of the few places that a roadway comes very close to the Bow River.

The two-lane, gravelled and paved 9th Avenue S.W. comes with 30 m (100 ft.) of the waterline in the vicinity of Crowchild Bridge.

There is public parking adjacent to the Pumphouse about 90 m (300 ft.) from the river.

There is pedestrian access to and along the riverbank along the entire length of this part of the river.

A1.5 THE DOWNTOWN, INCLUDING EAU CLAIRE AND CHINATOWN

(The right bank between Mewata Bridge and the Elbow River)

A1.5.1 Residential Houses

Most of the houses adjacent to the riverban are small, 40 o 60 year-old structures

A1.5.1.1 West of Centre Street

There are 17 properties - eight being City-owned - on 4th and 5th Avenues S.W. between 9th and 11th Streets, S.W., where the houses and the private property lines are 45 to 106 m (150 to 350 ft.) from the waterline and 22 to 30 m (75 to 125 ft.) outside the floodway and floodplalimits.

There are about 9 properties - three of which are City-owned - located on 1st and 2nd Avenues S.W. between 7th and 9th Streets S.W. The houses and private property lines are 90 to 120 m (300 to 400 ft.) from the waterline and 75 to 106 m (250 to 350 ft.) from the floodway. All of these properties are outside the floodplain.

"Eau Claire Estates" owns about 28 houses situated north of 1st Avenue S.W. and west of 6th Street S.W. which are 30 to 60 m (200 to 300 ft.) from the waterline and from 23 to 60 m (75 to 200 ft.) outside the fl

A1.5.1.2 East of Centre Street

On 2nd Avenue S.E. between Centre Street and 1st Street S.E there are ten properties, some having some commercial uses and all being in poor condition. The buildings and property lines are from 60 to 91 m (200 to 300 ft.) from the waterline and from 23 to 60 m (75 to 200 ft.) ouside of the floodway limit.

Five properties are situated on 6th Avenue S.E. between 5th an 6th Streets S.E. The buildings are 83 to 121 m (275 to 400 ft.) from the waterline and 45 to 60 m (150 to 300 ft.) from the floodway limit. The rear property lines are 75 to 91 m (250 to 300 t.) from the waterline and 15 to 30 m (50 to 100 ft.) outside of the floodway.

A1.5.2 Commercial

A1.5.2.1 West of Centre Street

There are two fairly modern, one-storey office buildings located on 4th Avenue S.W. by 9th Street S.W., one being owned by the City. The buildings and property lines are about 60 m (200 ft.) from the waterline and floodway limit.

The "Turbo" gas station on 4th Avenue S.W. by Louise Bridge is on City-owned land and is a little more than 60 m (200 ft.) from the waterlinwhich coincides approximately with the floodway and floodplain limits.

There is a small, two-storey building situated on the southeast corner of 2nd Avenue S.W. and 8th Street S.W. It has a "Metal Wood Products" sign on it. The building and property line are about 121 m (400 ft.) from the waterline and about 45 m (250 ft.) outside the floodwayand floodplain.

The "Richfield Building" is a two-storey structure located on the northeast corner of 1st Avenue and 1st Street S.W. and contains several firms' offices. The building is about 30 m (100 ft.) from the waterline and about 9 m (30 ft.) outside of the floodway. The property line is approximately 15 m (50 ft.) from the waterline and is adjacent to the floodway limit. The entire property is in the floodplain.

There are two, old, City-owned houses situated on 1st Avenue S.W. between Centre and 1st Streets S.W., which have offices in them. They are about 45 m (250 ft.) from the waterline and about 45 m (150 ft.) outside the floodway limit, and are entirely in the floodplain district.

A1.5.2.2 East of Centre Street (all of which are within the floodplain limit)

There are two houses used by a Chinese organization and a twostorey building with several commercial tenants which are located on the north side of 2nd Avenue S.E. between Centre and 1st Streets, S.E. The buildings are about 45 and 60 m (150 and 200 ft.) from the waterline and about 30 and 45 m (100 and 150 ft.) outside the floodway. The property lines are approximately 45 m (150 ft.) from the waterline and 30 m (100 ft.) outside the floodway limit.

There is a one-storey City-owned building situated on the southwest corner of 3rd Avenue S.E. and 3rd Street S.E. The building is about 60 m (200 ft.) from the waterline and about 45 m (100 ft.) outside the floodway limit.

Across 3rd Street S.E. from the above is a large one and two-storey warehouse which has several tenants. The building and property line are approximately 151 m (500 ft.) from the waterline and 36 m (120 ft.) outside the floodway.

"Muttart Builder's Supplies" has three buildings located on the north side of 4th and 5th Avenues S.E. between 4th and 5th Streets, S.E. Although private ownership extends to approximately the floodway limit about 30 m (100 ft.) from the waterline, some Provincial land which is inside the floodway is used for lumber storage. The two main buildings are about 45 m (150 ft.) from the waterline and 22 m (75 ft.) outside the but a large shed is completely within the floodway limit and approximately15 m (50 ft.) from the waterline.

"Cormack Manufacturing" - a furniture upholstery business - is a one-storey building on 3rd Avenue S.W. between 2nd and 3rd Streets, S.E. The building and property line are about 75 m (250 ft.) from the waterlineand approximately 60 m (200 ft.) outside of the floodway.

Another furniture upholstery business is "Gibb's Furniture", which is in a City-owned, old, two-storey building on 3rd Avenue S.E. just west of the old Langevin Bridge. The building is about 21 m (70 ft.) from the waterline and partially inside the floodway.

A1.5.3 Industrial

A large, old, two-storey brick building on City-owned land located on the southwest corner of 34th Avenue S.W. and 8th Street S.W. presently has an auto repair shop in it called "Historical Restorations". The building is about 151 m (500 ft.) from the waterline and entirely outside of the floodway and floodplain area.

All of the following industrial uses are within the floodplain limit.

The "Calgary Transit" bus garages are three large, one and twostorey buildings situated north of 1st Avenue S.W. and west of 2nd Street S.W. One building is about 22 m (75 ft.) from the waterline of the lagoon and is on the edge of the floodway.

The "Greyhound Lines" bus garages are two large buildings located north of 1st Avenue S.W. and east of 2nd Street, S.W. The larger building is about 60 m (200 ft.) from the waterline and about 45 m (150 ft.) outside of the floodway limit. The property line is approximately 15 m (50 ft.) from the waterline of the lagoon and is adjacent to the floodway.

"Canadian Automobile Recovery and Storage", an auto repair shop, is located on 4th Avenue S.E. between 3rd and 4th Streets, S.E. The building and property line are about 75 m (250 ft.) from the waterline and about 45 m (150 ft.) outside the floodway.

Another auto repair shop, "Lewis Paint and Body", is in a City-owned, one-storey brick building located on the north side of 1st Avenue S.E. between Centre and 1st Streets, S.E. The building is about 21 m (70 ft.) from the waterline and is just outside the floodway.

"Lakeview Superior Transport" is situated beside the above, also on 1st Avenue S.E. between Centre and 1st Streets, S.E. The two, onestorey brick buildings are approximately 15 m (50 ft.) from the waterline and are just outside the floodway. The property line extends to the waterline, but formal public access is allowed along the riverbank on a red shale pathway.

A1.5.4 Institutional

Only the last of these uses mentioned below is inside the floodplain boundary.

The "Calgary Centennial Planetarium" - located on City land on the southwest corner of 6th Avenue S.W. and 11th Street, S.W. - is approximately 91 m (300 ft.) from the waterline, which is also more or less the floodway limit.

The "Golden Age Club" is a City-owned senior citizens' social club situated on the northwest corner of 6th Avenue S.W. and 11th Street S.W. The one-storey building is about 100 ft. from the waterline, which is approximately the floodway limit.

The "Trinity Lutheran Church" is located on the northeast corner of 3rd Avenue S.W. and 8th Street S.W. The building - a house-sized structure built in 1963 - and the property line are about 151 m (500 ft.) from the waterline and about 75 m (250 ft.) outside of the floodway.

A Chinese church is situated west of the corner of 2nd Avenue S.W. and 1st Street S.W. There is also a house-sized structure that with the property line, is about 68 m (225 ft.) from the waterline and about 75 m (250 ft.) outside of the floodway.

A1.5.5 Established Parks and General Open Space

The first three areas and the last area are entirely or mostly outside of the floodplain district.

The stretch of open space between the river and Bow Trail from Mewata Bridge to 11th Street, S.W., is owned by the Province. It varies from 30 to 60 m (100 to 200 ft.) in width and is mostly outside of the floodway limit. It is mostly vacant and unimproved - the westerly third is used as a snow dump and the easterly third is largely used for parking.

The stretch of park between 4th and 5th Avenues S.W. and the river from 11th Street S.W. to Louise Bridge is also owned by the Province. It is approximately 12 m (40 ft.) wide with trees, grass, and benches and a red shale pathway. Below a sound wooden embankment is a strip of natural vegetation inside the floodway limit.

A largely vacant city block situated north of 4th Avenue, S.W. and east of Louise Bridge is owned by the City. It is covered with piles of earth and is presumably to be developed. It is entirely outside the floodway.

There is a large natural and semi-natural area (about 4 ha (10 acres) in size located between minor roads and the river from Louise Bridge and about the 8th Street S.W. alignment. It is owned by the Province. There is natural vegetation and large trees close to the river, and some land fill and parking closer to the road. There is also a red shale pathway through the area. The natural areas are inside the floodway limit.

The narrow 1.6 to 22 m (5 to 75 ft.) wide stretch of park between parking lots, buildings, and roads and the river from the 8th Street S.W. alignment to the Centre Street Bridge is also owned by the Province. There are planted trees, grass, and benches and a red shale pathway.

"Prince's Island Park" is a formal park of about 12 ha (30 acres), the westerly three-quarters of which are landscaped and planted and owned by the City and the easterly quarter of which remains as natural brush and is owned by the Province. Pedestrian access from the north across the river and from the south across the lagoon is via bridges at about the 3rd Street S.W. alignment. The park was established in 1968.

The stretch of park between the river and minor roads from Prince's Island to Fort Calgary is mostly owned by the City, with a small part owned by the Province. The west half of its length is planted with trees and grass and averages about 38 m (125 ft.) in width and the east half is constricted by buildings to only 7.5 m (25 ft.) in width. A red shale pathway runs along on the top of a dyke - which marks approximately the floodway limit.

"Fort Calgary" is a formal, landscaped, City-owned park of about 12 ha (30 acres) situated east of 6th Street S.E. and north of 9th Avenue S.E. at the confluence of the Bow and Elbow Rivers. It was established in 1976 but the historical facilities were only completed by 1978, consisting of the outline of the old Fort Calgary and a new, concrete "Interpretive Centre". Between about 1915 and 1975 the area was used by light industry such as warehouse and railway sidings.

A1.5.6 Recreational Land

Active play is possible in Prince's Island Park and Fort Calgary.

Activities such as walking, jogging, and cross-country skiing are possible in all the areas except for the vacant block just east of Louise Bridge. Picnicking can take place in both parks and there are also facilities for boating and concerts on Prince's Island.

The red shale pathway runs the entire length of this part of the river and so facilitates cycling.

A1.5.7 Public Access

Vehicular access is possible to within 30 to 75 m (100 to 250 ft.) of the river along the major Bow Trail between 11th and 14th Streets, S.W., but no stopping is possible (although informal parking seems to be available just west of the "Golden Age Club"). Access to within 75 to 91 m (250 to 350 ft.) of the river along minor paved roads is possible between Louise Bridge and 7th Street, S.W. Formal parking is available here.

Between 6th and 4th Streets S.W., access is possible to within 15 to 30 m (50 to 100 ft.) of the Prince's Island lagoon in a gravel parking lot (owned by "Eau Claire Estates"). There is a public gravel parking lot about 9 m (30 ft.) from the lagoon between 4th and 3rd Streets S.W. This is the major access point to Prince's Island. Vehicular access to within 30 to 91 m (100 to 300 ft.) of the river is possible along minor paved roads between Centre and 6th Streets, S.E.

Pedestrian access to the riverbank is provided for along the entire length of this downtown part of the river. There is also access to the waterline between Louise Bridge and Prince's Island and in the Fort Calgary Park. A new wooden staircase provides access down the wooden embankment to the west of Louise Bridge.

A1.6 INGLEWOOD

(The right bank between the Elbow River and the Bonnybrook CPR bridge)

A1.6.1 Residential Houses

Most of the houses are 40 to 80 year-old, single-family structures. The communities of Inglewood and Ramsay combined are a R.R.A.P. area. About 65 properties are less than 60 m (200 ft.) outside of the floodway and of these, eleven are from ten feet within, to completely within the floodway. Most of the community is inside of the floodplain. Thirteen properties have ownership to the waterline. The houses are divided into four groups as follows:

There are 32 houses situated on 8th Avenue S.E. between 8th Street S.E. and 13th Street S.E. The buildings vary from 60 m (200 ft.) away from the waterline towards the west to 150 m (500 ft.) towards the east and about 45 to 75 m (150 to 250 ft.) outside the floodway. The back property lines vary from 45 to 125 m (150 to 400 ft.) away from the waterline and about 15 to 60 m (50 to 200 ft.) outside of the floodway.

There are ten houses located on New Street between 13th Street S.E. and 15th Street S.E. The buildings vary from 15 to 90 m (50 to 300 ft.) from the waterline and from a location adjacent to the floodway limit to 45 m (150 ft.) away from it. The property lines do not extend to the waterline, although the six eastern properties are fenced to the waterline. About 15 to 40 m (50 to 125 ft.) of the depth of these properties is inside the floodway.

There are eight houses located on New Place and at the north end of 15th Street S.E. The houses vary from 15 to 90 m (50 to 150 ft.) from the waterline and from zero to 30 m (100 ft.) outside the floodway. The property lines vary from zero to 30 m (from the waterline and from partly within the floodway to 30 m outside of it.

There are about 16 houses on 7th and 8th Avenues S.E. between 19th Street S.E. and 23rd Streets S.E. with property lines less than 60 m (200 ft.) outside of the floodway. The houses vary from approximately 40 to 60 m (125 to 250 ft.) away from the waterline and 30 to 60 m (100 to 200 ft.) outside the floodway. The property lines vary from about 40 tc 70 m (125 to 225 ft.) away from the waterline and 25 to 60 m (75 to 200 ft.) outside the floodway.

A1.6.2 Multiple-Family Housing

There are two senior citizen apartment buildings located on 9th Avenue S.E. between 11th Street S.E. and 12th Street S.E. which were completed in 1976. The buildings are about 90 m (300 ft.) from the waterline and 45 m (150 ft.) outside the floodway. The property lines are approximately 90 m (300 ft.) from the waterline and 30 m (100 ft.) outside of the floodway.

A1.6.3 Commercial

There are two professional firms which have renovated and altered two old historic houses to be used as studios and offices. One is the engineering firm, "Jan Bobrowski and Partners", which owns a house located at 8th Avenue and 9th Street S.E. which was first owned by a Mayor of Calgary. The building is about 60 m (200 ft.) from the waterline and approximately 40 m (125 ft.) outside the floodway limit.

The other is the architecture and planning firm, "Long, Mayell, and Associates", which owns the "Major Stewart House" on New Street. The building is about 55 m (175 ft.) from the waterline and 30 m (100 ft.) outside of the floodway limit. The rear property lines extends to the waterline and about 25 m (75 ft.) of the property's depth is inside of the floodway. Both of these properties are entirely inside the floodplain.

A1.6.4 Industrial

The approximately 8 ha (20 acre) "Conforce" manufacturing site is located north of 12th Avenue S.E. and between 15th Street S.E. and the CPR Edmonton line right-of-way. The site consists of several large, one and two-storey buildings, an overhead travelling crane, parking and a large outside storage yard. The property is separated from the river by a 15 to 45 m (50 to 150 ft.) wide publicly-owned strip of land. The northern half of the site - where there are no buildings - is inside the floodway zone and most of the property is inside the floodplain.

"Russellsteel" is an approximately 4 ha (10 acre) heavy industrial site north of Blackfoot Trail and east of 18th Street S.E. The site consists of a large building, an overhead travelling crane, and an outside storage yard with a rail spur line connection. The site is separated from the river by a 45 to 75 m (50 to 250 ft.) wide Provincially owned strip of land, and the eastern half - in which there are no significant buildings - is within the floodway.

The approximately 25 ha (60 acre) "Gulf" Oil Refinery and tank-farm complex is between 9th Avenue S.E. and 31st Avenue S.E. alignment and between the 18th Street S.E. alignment and the CNR right-of-way. The portion of the property line closest to the river is along eastern 9th Avenue S.E. and is about 150 m (500 ft.) distant. Most of the site is outside the floodplain limit.

"A.P. Green Refractories" uses a building on 8th Avenue S.E. near 22nd Street S.E. which has a rail spur line connection for brick storage and offices. The building is on City-owned land and it is 20 m (60 ft.) from the waterline and approximately 15 m (50 ft.) outside the floodway limit.

There is a water intake owned by Gulf which partially occupies an approximately two-acre site near the river north of 9th Avenue S.E. and east of 23rd Street S.E. There is a small dam, reservoir, and building with an elevated pripeline leading to the Gulf site. The property line is separated from the river by a few feet of City land, but the mechanical equipment is inside the floodway.

A1.6.5 Institutional

In the Pearce Estate by the CPR Edmonton line is the "Sam Livingston Fish Hatchery", which is operated by the Alberta Government. It is a large concrete building finished in 1973 and is about 300 ft. from the waterline and entirely inside both the floodway and floodplain limits.

The "Colonel Walker House" on Bird Sanctuary Road in the Inglewood Bird Sanctuary is owned by the City and contains natural history displays and washrooms open to the public. It is a few feet from the lagoon and outside the floodplain.

A1.6.6 Established Parks and General Open Space

Unless otherwise noted, these areas are entirely within the floodplain limit.

The eastern part of the new Fort Calgary park is a small landscaped and planted park on the east side of the Elbow Park at its confluence with the Bow River. It has two historical houses and benches and red shale pathways. There is room for active play to take place. The north end is inside the floodway limit.

The stretch of the Bow's riverbank between the Elbow River and New Street has recently reverted from being CNR right-of-way and is now City-owned. The western part is unimproved but the eastern part has been landscaped and planted with trees. It is mostly inside the floodway and varies 30 to 90 m (100 to 300 ft.) in width.

The stretch of the riverbank between 15th Street S.E. and the CPR bridge is partly City- and partly W.I.D.-owned and has semi-natural vegetation with large planted trees. It varies from 15 to 45 m (50 to 150 ft.) in width and has a dyke with a pathway and benches on the top. It is completely inside the floodway zone.

The "Pearce Estate" is an established City park of about 14 ha (36 acres) located east of the CPR Edmonton Line and north of the 11th Avenue S.E. alignment, and is described in Calgary's Natural Areas. It has large trees and the area now has only planted grass. There are picnic tables, benches, pathways, washrooms, and a parking area. There is also the "Sam Livingston Fish Hatchery" and its outflow canal which cuts across the park. In addition, there is a forested semi-natural strip of W.I.D.-owne along the river at the north end of the park and a large forested and grassed natural area of Provincial land on the east end of the park. The park is mostly within the floodway.

There is Provincially-owned strip of park between the "Russellsteel" site and the river south of Pearce Estate. It varies from 15 to 60 m (50 to 200 ft.) wide and is landscaped and planted and has a red shale pathway. A berm helps shield the Russellsteel site from the riverbank. The park area is entirely inside the floodway

There is a City-owned, fenced-in playground just south of Cushing Bridge which has facilities for active play and sports and is about 3 ha (7 acres) in area. It is partly inside the floodway.

There is a very narrow strip of open space sandwiched between the CNR track and the river from 21st Street S.E. to 2nd Street S.E. which is within the CNR right-of-way. A trail is on the top of the bank and the area is inside the floodway limit.

There is a largely vacant open space along the river between 22nd Street S.E. and the "Brink Brothers" property which is partly City owned and partly "Gulf" owned. It has a red shale pathway and natural grasses, with only a small part being inside of the floodway and floodplain limits.

The "Inglewood Bird Sanctuary" is an established, City-owned natural area of about 25 ha (60 acres) located between the CNR right-of-way and the river, and is described in Calgary's Natural Areas. It has mostly natural vegetation, some lagoons, and several pathways. Road access is from 9th Avenue S.E. via Bird Sanctuary Road to the "Colonel Walker House", where there is parking. Most of the area apart from the house is inside the floodway and floodplain limits.

There is a narrow strip of open space situated between the high CNR dyke with its track and the river from the 34th Avenue S.E. alignment to the Bonnybrook CNR bridge. It has natural vegetation and almost no signs of human activity and is inside the floodway and floodplain limits.

Activities such as walking, jogging, and cross-country skiing are possible in all of the described areas.

A1.6.7 Public Access

Vehicular access close to the river is possible between 8th and 15th Streets S.E. and 21st and 23rd Streets S.E. In more detail, the access roads are described as follows: A gravel lane is parallel to the river and about 45 to 75 m (150 to 250 ft.) away, between 8th and 12th Streets S.E. The paved 8th Avenue S.E. is parallel to the river and about 90 to 165 m (300 to 550 ft.) away, between 8th and 13th Streets S.E. The paved New Street is parallel to the river and about 120 to 60 m (400 ft. to 200 ft.) away, between 13th and 15th Streets S.E. The paved 15th Street S.E. reaches a dead-end at the bank-top. The tarred and gravelled 7th Avenue S.E. and 21st Avenue S.E. intersect about 30 m (100 ft) away from the river. The tarred and gravelled 8th Avenue S.E. is parallel to the river and about 90 to34 m (300 to 150 ft.) away between 21st and 23rd Streets S.E. The gravelled Bird Sanctuary Road leads south from 9th Avenue S.E. to the Bird Sanctuary parking area and further south to the riverbank. There is also the paved 17A Street S.E. which leads to the Pearce Estate parking area and the Fsh Hathery.

Pedestrian access to and along the river is possible along the community's entire river frontage, except for the riverbank between New Place and 15th Street S.E. The access is generally formal; marked either by a red shale pathway or an intensively-used trail.

A1.7 BONNYBROOK BRIDGES - GLENMORE TRAIL AREA

A1.7.1 Residential

There is an abandoned house and a few outbuildings situated on City-owned land at about the 51st Avenue S.E. alignment. The buildings are about 135 m (450 ft.) from the waterline and are inside the floodway limit.

A group of farmhouses and outbuildings - only some of which are occupied - are situated on City-owned land immediately out of the CNR right-of-way at about the 55th Avenue S.E. alignment. All of the buildings are more than 150 m (500 ft.) from the river and are at the edge of the floodway limit.

Both of these groups of buildings will be removed during the construction of Deerfoot Trail.

A1.7.2 Commercial

There is an office building located between Ogden Road and the CPR right-of-way near Bonnybrook Bridge. This new, two-storey building and the property line are both approximately 60 m (200 ft.) from the waterline, about 30 m (100 ft.) outside the floodway limit and entirely within the floodplain.

A1.7.3 Industrial

The "Bonnybrook Sewage Treatment Plant" occupies a 12 ha (30 acre) parcel of City-owned land located in a larger, 50 ha (130 acre), area of City land which extends along the river from Ogden Road to the CNR right-of-way at the Millican CNR bridge. The plant is set back from the river; the closest point being about 45 m (150 ft.) away at the 49th Avenue S.E. alignment. The structures are low-lying and are outside the floodway limit. The effluent outlet is at the 50th Avenue S.E. alignment.

The CNR track - which crosses the river at about the 55th Avenue S.E. alignment - is raised on a 10 m (30 ft.) artificial earth embankment. This creates a visual and physical barrier, restricting pedestrian access along the riverbank to a narrow space under the west end of the CNR bridge.

"Burnco" owns about 30 ha (75 acres) along the river between the 64th Avenue S.E. alignment and Glenmore Trail. There is a sand extraction plant and at the 68th Avenue S.E. alignment there is a 2 ha (5 acre) storage area for industrial vehicles and equipment which is about 45 m (150 ft.) from the waterline. The latter area is separated from the river by a strip of natural vegetation.

A1.7.4 Public Access

Vehicular access is along an unnamed road which parallels the river for about 275 to 400 m (900 to 1,400 ft.) distant between 15th Street S.E. and Glenmore Trail. There is informal access to the riverbank on the north side of the CNR bridge.

Pedestrian access is possible informally along the riverbank on City-owned land between Bonnybrook Bridge and the 64th Avenue S.E. alignment. The land and riverbank between the 64th Avenue S.E. alignment and Graves Bridge is private.

Activities such as walking, jogging and cross-country skiing can take place along the City-owned riverbank between the Bonnybrook CPR bridge and the 64th Avenue S.E. alignment. The riverbank between the 64th Avenue S.E. alignment and Graves Bridge is privately-owned.

A1.7.5 Established Parks and General Open Space

There is an approximately 3 ha (7 acre) City-owned natural area located along the river between Ogden Road and the 48th Avenue S.E. alignment. It is a heavily-forested area with no signs of human activity aside from a trail and a vehicle track. It is entirely within the floodway.

Separated from the river by the above area is a large, flat area of City land which is largely open grassland with few trees. There are no signs of activity here aside from some snowmobile tracks in the winter. The area is largely outside the floodway.

The City-owned open area between the sewage plant and the CNR alignment is of a similar character to the above area with regard to vegetation and human activity. The Deerfoot Trail bridge will be at the 50th Avenue S.E. alignment and the highway will run through this open area and under the CNR track. The bridge is presently under construction. Pedestrian access will be provided for beneath its western end.

South of the Millican CNR bridge is an approximately 3 ha (8 acre) area of City-owned open space. Grass is the only vegetation and it has been disturbed by vehicle activity. The area is low-lying and inside the floodway limit.

The City-owned land around the farm buildings located south of the CNR alignment is being used as a cattle pasture. However, a tree farm has been proposed by the Land Department for the property until the construction of Deerfoot Trail disrupts the area.

Between the 58th and 64th Avenue S.E. alignments is a privately operated tree farm located on leased City-owned land. There is natural vegetation along the bank and an important grove of large trees at the southern end of the tree farm. Construction of Deerfoot Trail will remove a large part of the western side of the tree farm, and the remaining area has been subdivided and will become industrial sites. A community reserve which corresponds to the area within the floodway limit has been dedicated.

There is a 45 m (150 ft.) wide natural area owned by "Burnco" located adjacent to the river between the 66th and 60th Avenue S.E. alignments. It is a low area below the bank which is covered with trees and brush and lies within the floodway.

Back from the riverbank between the 69th Avenue S.E. alignment and Graves Bridge is a large vacant area of land owned by "Burnco". The area is covered only with some grass and has a few landfill sites. A dyke runs along the top of the bank.

A1.8 GLENMORE TRAIL - QUEENSLAND DOWNS AREA

(The right bank between Graves Bridge and the 19th Street S.E., alignment)

A1.8.1 Residential

A trailer court located between the edge of the top of the escarpment and Blackfoot Trail is at about the 90th Avenue alignment. It is about 300 m (1,000 ft.) from the waterline and outside the flood plain.

"Queensland Downs" is a new single-family subdivision located on the top of the riverine escarpment and at its closest to the river - along Queensland Circle and Queen Anne Way - is about 210 m (700 ft.) away from the waterline (which is the floodway and flood plain limits).

A1.8.2 Industrial

"Consolidated Mining and Smelting Co. (Cominco)" owns all the land along the river between Graves Bridge and about the 88th Avenue S.E. alignment. The area closest to the river has largely natural vegetation and is described in *Calgary's Natural Areas*. The actual chemical and fertilizer plant complex is located between the 74th and 80th Avenue S.E. alignments and about 1 km (.6 mile) from the river just outside the floodway limit. There is a railway spur for storing railway tank cars which is about 180 m (600 ft.) from the river at the 80th Avenue S.E. alignment. There are intake and outflow canals which join the river at about the 77th, 81st, and 87th Avenue S.E. alignments. The future Deerfoot alignment will cut through this area.

"Canfarge Ltd." (a division of Conmac Western Industries) owns land along the river between the 99th and 113th Avenue S.E. alignments. There is a sand and gravel extraction operation in the northern half of the site. There are four buildings at the 104th Avenue S.E. alignment which are 90 m (300 ft.) or less from the river, and two of which are inside the floodway limit.

A1.8.3 Recreational Land

The large area of City-owned open space between the 88th and 99th Avenue S.E. alignments can be used for informal play and sports.

Activities such as walking, jogging and cross-country skiing can take place in the above area, although there are no formal facilities. The riverbank to the north and south of this area is privately-owned, except for the City-owned escarpment between the 114th Avenue S.E. alignment and the 19th Street S.E. alignment.

A1.8.4 Established Parks and General Open Space

The "Cominco Natural Area" occupies about 80 ha (200 acres) in the eastern part of the Cominco property, and extends along the river between Glenmore Trail and the 88th Avenue S.E. alignment. It is described in *Calgary's Natural Areas*. No public access is allowed in this area. There is a small, forested island near the south end of this natural area. It is owned by the Province and there is no access to it. The future Deerfoot alignment will cut through this area.

Between the 88th and 99th Avenue S.E. alignments is about 100 ha (250 acres) of City-owned open space which is covered with seminatural grasses and has some groves of trees near the river. There is no active use of the area at present aside from some informal vehicle activity. The future Deerfoot Trail alignment will cut through this area.

There are two tree-covered islands in the river at the 90th and 97th Avenue S.E. alignments which are owned by the Province. There is no access to either of them.

By the river at the southern end of the "Canfarge" property about the 113th Avenue S.E. alignment - is located an approximately 2 ha (5 acre) area covered with semi-natural vegetation. This area has been disturbed by vehicle activity. The future Deerfoot alignment will cross the river just to the north of the area.

The City-owned escarpment, which borders the river between the 114th Avenue S.E. alignment and the 19th Street S.E. alignment, is about 30 m (100 ft.) high and has a slope of about 1:2. It is covered with natural vegetation: mainly a forest of deciduous and coniferous trees. There is a trail along the river's edge and a few others on the slope of the escarpment.

A1.8.5 Public Access

There are no public roads in the vicinity of the river. However, the public makes use of a vehicle steep track down the escarpment at about the 88th Avenue S.E. alignment and some tracks near the riverbank in the large City-owned area.

Pedestrian access to the river is possible informally in this City-owned area and along the trails on the City escarpment by Queensland Downs.

A1.9 SILVER SPRINGS AND VARSITY ACRES

(The left bank between the 85th Street bridge and the 32nd Avenue alignmenN.W.)

A1.9.1 Residential

The single-family development of "Silver Springs" is located along the top of the riverine escarpment and is about 450 m (1,500 ft.) from the river at Silver Valley Boulevard, about 250 m (800 ft.) at Silver Crest Drive, and about 180 m (600 ft.) at Silverview Drive and Silverview Way.

The single-family development of "Varsity Acres" is also located along the top of the escarpment and is about 450 m (1,500 ft.) from the river at 40th Avenue, about 190 m (650 ft.) at Varscliff Place, and about 150 m (500 ft.) at Varna Crescent.

L. Fournier owns an approximately 5 ha (13 acre) property located at about the 75th Street alignment. There are two buildings on the site which are situated at the edge of the floodway and floodplain limits about 120 m (400 ft.) from the river. The property lines extend to the waterline.

A1.9.2 Industrial

The CPR mainline right-of-way extends across the western part of the area and crosses the river at the 79th Street N.W. alignment.

A1.9.3 Established Parks and General Open Space

This entire area, which includes the escarpment and the flat land at the foot of the escarpment, is known as "Montgomery Flats" or "Bowmont Flats". Most of it is owned by either the City or the Province, except for the Fournier property at the 75th Street N.W. alignment and the large "Klippert Concrete" property located south of the 40th Avenue N.W. alignment. "Bowmont Flats" has been proposed as a City park but presently there are no facilities aside from a tarmac trail. Parts of the area are disturbed by vehicle tracks. The area's flora and fauna are described in Calgary's Natural Areas. Generally, the escarpment is covered with grasses and has a slope varying from 2:7 to 3:4 and an average height of about 50 m (160 ft.). The low, flat land at the western and eastern ends of the area are mostly covered with natural trees and brush (except for the disturbed areas) and are about 40% within the floodway limit and about 80% within the floodplain limit.

Most of the flat areas at the foot of the escarpment which are publicly owned can be used for active play or informal sports, especially those areas already disturbed. However, there are presently no facilities. The publicly-owned flat areas and escarpment have several trails which enable walkers, joggers, and cross-country skiers to use this area.

A1.9.4 Public Access

Private roads lead into the western part of the area east from 85th Street N.W. and from 32nd Avenue N.W. to the Klippert site.

Numerous trails lead down and along the escarpment and from 85th Street N.W. into the flat area, providing informal pedestrian access to the public parts of the river. There is also a new, red shale pathway which leads from 52nd Street N.W. along the riverbank adjacent to the Klippert property.

A1.10 MONTGOMERY

(The left bank between 37th Street N.W. and 32nd Avenue N.W. alignment)

A1.10.1 Residential Houses

Most of the houses are single-family structures generally 30 to 50 years old, except for the new "Point McKay" development. The communities of Bowness and Montgomery combined are a R.R.A.P. (Residential Rehabilitation Assistance Program) area. A total of about 35 properties are less than 60 m (200 ft.) outside of the floodway limit and ownership of about 22 properties extend to the waterline. The houses are divided into the following seven groupings.

Eleven properties are located between 52nd Street N.W. and the river. The houses are about 30 to 45 m (100 to 150 ft.) from the waterline. Ten of these properties are over 25 m (75 ft.) outside the floodway and floodplain limits, whereas the remaining one is at the edge of the floodway limit and within the floodplain limit. All the property lines extend to the waterline - which is also the floodway and floodplain limit for 10 of these properties.

There are 10 parcels with about 30 houses, barns, etc. on them, between 13th Avenue N.W. and the river. At least two buildings are completely inside of the floodway limit and the rest are from 3 to 120 m (10 to 400 ft.) outside. All the properties extend to the waterline, while the floodway limit is parallel to it and 60 m (200 ft.) away. All are completely inside of the floodplain limit.

There are six properties - two being City-owned - on Montgomery Avenue. The houses are about 90 m (300 ft.) from the waterline and about 45 m (150 ft.) outside of the floodway limit. The private property lines are approximately 75 m (250 ft.) from the waterline and nearly 25 m (75 ft.) outside of the floodway limit. They are all completely inside of the floodplain limit.

Between the Trans-Canada Highway and the river at 43rd Street N.W. there are two properties where the houses are approximately 30 m (100 ft.) from the waterline and less than 15 m (50 ft.) outside of the floodway and floodplain limits. The property lines are about 15 m (50 ft.) away from the waterline and a few metres inside of the floodway and floodplain limits.

There are four properties between the Trans-Canada Highway and the river on a street called "4100 Block, 16th Avenue". The houses are about 55 m (175 ft.) from the waterline and about 30 m (100 ft.) outside of the floodway limit. The property lines are around 30 m (100 ft.) from the waterline and about 15 m (50 ft.) outside of the floodway limit. In this case the floodway and floodplain limits coincide.

South of the Trans-Canada Highway and west of 37th Street N.W. is the "Point McKay" residential subdivision. It is about 16 ha (40 acres) in area and presently under development. Most of the subdivision is within the floodplain. A 60 to 90 m (200 to 300 ft.) strip of open space immediately adjacent to the City-owned riverbank is community reserve and includes the floodway.

A1.10.2 Multiple-Family Housing

The three-storey "Bow View Nursing Home" is situated on Montgomery Boulevard. The Building is about 45 m (150 ft.) from the waterline and at the edge of the floodway limit. The front property line is approximately 40 m (125 ft.) from the river and inside of the floodway limit, whereas the property is entirely within the floodplain.

There is a trailer court - "Bow Bend Trailer Park" - at the west end of 13th Avenue N.W. which has about 40 trailer homes. The closest trailers to the waterline are about 45 m (150 ft.) away whereas about 10 trailers are inside the floodway. The property line extends to the waterline and the floodway limit is approximately 75 m (250 ft.) back from the waterline. The entire property is inside the floodplain.

A1.10.3 Commercial

"Bowmont Automatic Transmission" is a one-storey building on City land at 17th Avenue N.W. and 41st Street N.W. The building is about 75 m (260 ft.) from the waterline and about 240 feet outside the floodway and floodplain.

A1.10.4 Institutional

The "Maranatha Christian Reformed Church" is between 52nd Street N.W. and the river just west of Home Road. The church is about 30 m (100 ft.) from the waterline, which is also the floodway and floodplain limits. The property line extends to the waterline.

A1.10.5 Established Parks and General Open Space

A piece of City-owned open space about 2 ha (5 acres) in area at Home Road and 52nd Street N.W. is a semi-natural area and has a few large trees. It is a steeply-sloping site located at the top of the high, steep, privately-owned riverbank/escarpment - about 45 m (150 ft.) from the waterline and floodplain limit.

An arrangement has been made between the City and "Al Klippert Concrete" to do landscaping, planting, and to allow an easement for public pedestrian access through a 45 to 75 m (150 to 250 ft.) wide strip of the riverbank extending north from about 52nd Street N.W. to at least about the 36th Avenue N.W. alignment. The above two areas are outside of the floodplain limit.

"Shouldice Park" is an established, City-owned park with various sports facilities and the Montgomery Community Building. It also has picnic facilities in the part north of the Trans-Canada Highway along the riverbank. The stretch of the riverbank in this park to the west of Home Road has only planted grass and a red shale pathway and the bank is high with no vegetation. Both of these stretches of riverbank are mostly inside of the floodway limit.

There is a small City-owned, informal park behind the Bow View Nursing Home on Montgomery Avenue which has planted grass and trees and is inside the floodplain but outside the floodway.

There is another equally small City-owned open space between 16th and 17th Avenues N.W. at 43rd Street N.W. with unkempt planted vegetation which is used as an informal play area. It is outside the floodplain limit.

The last two areas described have been recommended in the "Bowmont Design Brief" to be developed for residential purposes. Active play can take place in all of the above areas.

There is a strip of City-owned open land along the river between Home Road and Edworthy Park's Boothman pedestrian bridge which varies from 15 to 60 m (50 to 200 ft.) in width. It is generally only grassed with a red shale pathway, and is largely inside the floodway.

A strip of City-owned land between the Edworthy Park bridge and 37th Street N.W. is presently about 60 m (200 ft.) wide. A portion has been dedicated reserve as a result of the Point McKay subdivision. The remainder is within a right of way retained by the Transportation Department as an option to extend Memorial Drive.
It has a gravel road and a red shale pathway, with planted grass away from the river and natural vegetation along the river's edge. This area straddles the floodway and floodplain.

Activities such as walking, jogging, and cross-country skiing can take place in all of the described open spaces and parks, whereas cycling is possible in those areas with a roadway or the red shale pathway.

A1.10.6 Public Access

Vehicular access is possible to within 45 m (150 ft.) of the river along the short Montgomery Boulevard and the gravel road running parallel to the river between 41st Street N.W. and 37th Street N.W. Small parking areas close to the river are in northern Shouldice Park and near the Edworthy Park pedestrian bridge.

The road system otherwise is more distant from the river: the minor 52nd Street N.W. is about 75 to 120 m (250 to 400 ft.) away from the river; tar-and-gravel 13th Avenue N.W. is about 90 to 240 m (300 to 800 ft.) from the river. Montgomery Avenue - which is also a minor roadway - is about 100 m (350 ft.) away and the Trans-Canada Highway comes within 30 m (100 ft.) of the river at 41st Street N.W.

Pedestrian access to and along the riverbank is provided along the entire length of the river except for where private residential properties extend to the river's edge along 52nd Street N.W. and 13th Avenue N.W.

A1.11 PARKDALE

(The left bank between 37th and 28th Streets N.W.)

A1.11.1 Residential Houses

There are 31 properties on Parkdale Boulevard between 37th and 28th Streets N.W. which are mostly single-family, 30 to 40-year old dwellings. The houses are approximately 70 m (225 ft.) from the waterline and about 30 to 60 m (100 to 200 ft.) outside the floodway. The property lines are about 60 m (200 ft.) from the waterline and about 25 to 45 m (75 to 150 ft.) outside the floodway. The western third of the properties are inside the floodplain.

A1.11.2 Multiple-Family Housing

There are three apartment buildings on Parkdale Boulevard east of 34th Street N.W. They are two-storey, 30 to 40-year old structures about 60 m (200 ft.) from the waterline and about 45 m (150 ft.) outside the floodway. The property lines are approximately 55 m (175 ft.) from the waterline and about 30 m (100 ft.) outside the floodway. All of the westernmost building and half of the centre one are inside the floodplain.

A1.11.3 Commercial

"Foothills Driver Education" is at the junction of Parkdale Boulevard and 3rd Avenue N.W. (Bowness Road). It is a one-storey former gas station about 60 m (200 ft.) from the waterline and completely outside the floodway. The property line is about 60 m (200 ft.) from the waterlinand completely outside both the floodway and floodplain limits.

A1.11.4 Established Parks and General Open Space

There is a strip of City-owned general open space from 28th to 37th Streets N.W. between Parkdale Boulevard and the river. It is 40 to 55 m (125 to 175 ft.) wide and has planted grass with natural vegetation along the bank. Only a part of its width is inside the floodway and floodplain limits.

Informal sports and play activities to take place along with walking, jogging, cycling, and skiing.

A1.11.5 Public Access

There is vehicular access to within about 40 to 55 m (125 to 175 ft.) of the river along Parkdale Boulevard, which is a four-lane major thoroughfare between 28th and 32nd Streets N.W. and a two lane minor road between 32nd and 37th Streets N.W.

There is pedestrian access to and along the river along the entire length of the community's frontage on the river.

A1.12 WEST HILLHURST

(The left bank between the 28th and 18th Street alignments, N.W.)

A1.12.1 Residential Houses

Most of the houses are 30 to 40 year-old, wooden frame, single-family structures. No private property extends to the waterline. Fifteen property lines and the "Lions Bungalows" property line are less than 60 m (200 ft.) outside of the floodway. The houses are discussed in three groups as follows.

There are 22 properties on Parkdale Boulevard between 25th and 28th Streets N.W. The houses are about 60 to 75 m (200 to 250 ft.) from the waterline and about 45 m (150 ft.) outside the floodway limit - which is also the floodplain limit in this area. The property lines are 45 to 60 m (150 to 200 ft.) outside of the floodway.

The "Lions Bungalows" consists of 12 small houses and a new common building at Kensington Road and Memorial Drive. The property line is about 60 m (200 ft.) from the waterline and approximately 45 m (150 ft.) outside the floodway and floodplain limits.

Three houses and two duplexes are situated on Westmount Boulevard between 19th Street N.W. and the 18th Street N.W. alignment. The buildings are 60 m (200 ft.) from the waterline and about 30 m (100 ft.) outside the floodway limit. The property lines are about 10 m (25 ft.) closer to the waterline and floodway and entirely within the floodplain.

A1.12.2 Commercial

A new, one-storey building with three stores is located on the northern corner of Kensington Road and Memorial Drive. The building is approximately 75 m (250 ft.) from the waterline and about 60 m (200 ft.) outside the floodway and floodplain limits. The property line is about 60 m (200 ft.) from the waterline and approximately 45 m (150 ft.) outside the floodway and floodplain limits.

Another new 1 1/2-storey building is the "Guide-Scout Service Centre", which is located at 20th Street N.W. and Brownsea Drive. The building is 60 m (200 ft.) from the waterline and about 30 m (100 ft.) outside the floodway limit. The property line averages 90 m (300 ft.) from the waterline which is 30 to 60 m (100 to 200 ft.) outside the floodway limit. The property is entirely inside the floodplain limit.

A1.12.3 Institutional

The "First Church" is a one-storey structure at 27th Street N.W. and Parkdale Boulevard. It is about 75 m (250 ft.) from the waterline and 60 m (200 ft.) from the floodway and floodplain limits. The property line is about 10 m (25 ft.) closer to both the floodway and floodplain limits.

A City Firehall, housed in a new, brick building at 19th Street N.W. and Westmount Boulevard is about 60 m (200 ft.) from the waterline and about 40 m (125 ft.) outside the floodway but inside the floodplain.

A1.12.4 Established Parks and General Open Space

There is a City-owned strip of open space along the riverbank between 28th Street N.W. and Crowchild Bridge and between 20th Street N.W. and the 18th Street N.W. alignment. There is some planted grass and natural vegetation on the bank, and a red shale pathway along the banktop which permits activities such as cycling, walking, jogging and cross-country skiing. The strip varies from about 15 to 45 m (50 to 150 ft.) wide, and is mostly outside of the floodplain.

There is a five-acre, City-owned vacant site along the river to the east of Crowchild Bridge which is cut off from an equally-sized area isolated between the two lanes of Memorial Drive.

A small community sports field between 19th and 20th Streets N.W. has no substantial buildings or formal facilities. It is inside the floodplain, but outside the floodway.

Active play and sports can take place on the sports field, which has structures for storage and shelter, and on the two, a ha (5 acre) pieces of land.

A1.12.5 Public Access

There is vehicular access to within 15 to 90 m (50 to 300 ft.) of the river along Memorial Drive and Parkdale Boulevard, which extend along the entire length of the community's river frontage. They are both major, four-lane, paved roads.

Pedestrian access to and along the river is possible along the entire length of the riverbank.

A1.13 HILLHURST-SUNNYSIDE

A1.13.1 Residential Houses

Most of the houses are 40 to 60 year-old, single-family structures, although they are generally less old west of 10th Street N.W. This is a R.R.A.P. (Residential Rehabilitation Assistance Program) community. About 104 properties are less than 60 m (200 ft.) outside the floodway, however, none are inside of it, although all are within the floodplain limits. The houses are divided into two groupings as follows.

Situated on Westmount Boulevard between 14th Street N.W. and 18th Street N.W. alignment are 21 properties, some of which are old duplexes. The buildings are from about 60 to 90 m (200 to 300 ft.) from the waterline and 30 m (100 ft.) outside the floodway. The property lines are about 55 to 75 m (175 to 250 ft.) from the waterline and about 30 m (100 ft.) outside the floodway.

No residential property lines on Memorial Drive between 10th and 14th Streets N.W. are less than 60 m (200 ft.) from the floodway.

There are 83 properties located along Memorial Drive between 3rd and 10th Streets N.W. The houses are about 30 to 60 m (100 to 200 ft.) from the waterline and from 15 to 45 m (50 to 150 ft.) outside the floodway. The property lines are from 25 to 60 m (75 to 200 ft.) from the waterline, more or less, and a minimum of 10 m to a maximum of 45 m (25 to 150 ft.) outside the floodway.

A1.13.2 Multiple-Family Housing

There are 9 buildings located on Memorial Drive between 5A Street N.W. and 10A Street N.W. which are about 40 to 70 m (125 to 225 ft.) from the waterline and about 40 to 60 m (125 to 200 ft.) outside of the floodway. The property lines are about 40 to 60 m (125 to 200 ft.) from the waterline and 40 to 55 m (125 to 175 ft.) outside of the floodway. They are completely within the floodplain limit.

A1.13.3 Commercial

There are three approximately 50 year-old, two storey, brick buildings situated on Memorial Drive between 10th Street and 10A Street N.W. The building on the 10th Street N.W. corner is the old "Ross Block", a heritage site. The three buildings have several small stores on the first floor and apartments on the second. The buildings and the property line are about 60 m (200 ft.) from the waterline and floodway limit and are inside the floodplain.

There is an approximately 30 year-old, one storey building located on the northeast corner of Memorial Drive and 10th Street N.W. It houses an antique store. This building and the property line are about 45 m (150 ft.) from the waterline and floodway limit, and are inside the floodplain.

The "Calgary Curling Club" is a building constructed in 1977 on 3rd Street N.W. on City land. The two-storey, steel-frame structure is approximately 90 m (300 ft.) from the waterline and about 45 m (150 ft.) outside the floodway limit but inside the floodplain.

A1.13.4 Institutional

The "CBC" building is a new one to three-storey brick and concrete structure situated on Westmount Boulevard between 16th and 17th Streets N.W. The building is about 60 m (200 ft.) from the waterline and 30 m (100 ft.) outside the floodway. The front property line is about 10 m (25 ft.) closer. The entire property is inside the floodplain.

A1.13.5 Established Parks and General Open Space

There is a City-owned strip of open space about 10 m (40 ft.) wide which runs along the riverbank westwards from Mewata Bridge. It is partly a dyke with grass and a red shale pathway, and partly natural vegetation and is completely within the floodway and floodplain limits. Between this dyke and Memorial Drive just west of Mewata Bridge is a small one-acre landscaped City park space. It is inside the floodway and floodplain limits.

A City-owned park varying from 3 to 40 m (10 to 125 ft.) wide runs along the riverbank between the Louise and Centre Street Bridges. It varies from only a narrow strip to an established park, with an asphalt pathway extending the entire length along the banktop or dyke. This area varies from being wholly to partially located in the floodway.

There is a small City-owned playground which has tot lot facilities and a rink at the corner of Memorial Drive and 9A Street N.W. which is outside the floodway limit.

A former City-owned vacant area between Memorial Drive and the river escarpment to the east of 3rd Street N.W. has been developed in 1977 into a commuter's parking lot and a landscaped park space. It averages about 60 m (200 ft.) in width and is partly within the floodplain limit but outside the floodway limit.

Active play and informal sports can take place in the latter two areas. Activities such as walking, jogging, and cross-country skiing are possible in all areas but the City-owned playground. Cycling is possible along the community's riverbank because of the red shale pathway and asphalt pathways.

A1.13.6 Public Access

Vehicular access is possible from 3 to 100 m (10 to 325 ft.) from the river along Memorial Drive - a major three to four-lane road - which extends along the community's entire riverbank. Stopping is difficult, however, and only one formal parking area is available at 10A Street N.W.

City Council have proposed to widen the narrow part of Memorial Drive between about 9th Street and 10th Street N.W. to a four-lane road.

Pedestrian access is provided for along the entire riverbank.

A1.14 CRESCENT HEIGHTS

(The left bank between the Centre Street Bridge and the old Langevin Bridge)

A1.14.1 Residential

There are only two City-owned, old single family houses which are less than 60 m (200 ft.) outside of the floodway and floodplain limits. One is on Meredith Road, the other on Memorial Drive, and both are west of Edmonton Trail. The former is about 90 m (300 ft.) from the waterline and 60 m (200 ft.) outside the floodway; the latter is about 60 m (200 ft.) from the waterline and 25 m (75 ft.) outside the floodway.

A1.14.2 Commercial

There are five buildings between Meredith Road and Memorial Drive, all of which are owned by the City.

On the northwest corner of Memorial Drive and Edmonton Trail is "Farmer Jones Carz", which consists of a small, old building and display area. The building is about 75 m (250 ft.) from the waterline and 45 m (150 ft.) outside the floodway.

On the southwest corner of Edmonton Trail and Meredith Road is a three-storey brick building called the "Reliance Block" which was built in 1910. It has several commercial tenants on the main floor and apartments on the second and third floors. It is about 90 m (300 ft.) from the waterline and 60 m (200 ft.) outside the floodway.

Just west of the above building on Meredith Road are two old, onestorey buildings housing "Riverside Plumbing and Heating" and "Westcan Tile and Marble". They are about 100 m (350 ft.) from the waterline and 75 m (250 ft.) outside the floodway limit.

Farther west on Meredith Road is a group of old, one and two-storey buildings with several tenants. The space between the building and Memorial Drive is a parking area. The group of buildings is about 60 m (200 ft.) from the waterline and 30 m (100 ft.) outside the floodway.

A1.14.3 Established Parks and General Open Space

There is a strip of City-owned park between Memorial Drive and the foot of the escarpment which varies from 90 m (300 ft.) wide near Centre Street to less than 15 m (50 ft.) wide at about the 3rd Street N.E. alignment. It has planted grass and trees, but there is no convenient pedestrian access. It is mostly inside the floodway limit. This is the only reach of the river where some active play or sports are possible.

The City-owned escarpment is steep, with an approximately 1;2 slope, about 30 m (100 ft.) high, and has natural vegetation.

There is a strip of City-owned park along the river between the Centre Street and old Langevin Bridges which varies from 10 to 30 m (25 to 100 ft.) wide. It has trees, grass, and a pathway. At about the 2nd Street N.E. alignment there is a 120 m (400 ft.) long stretch of the riverbank which is used as a snow dump. It bisects the riverbank park and has a barren appearance in the summer. This area is entirely inside the floodway.

Activities such as walking, jogging, and cross-country skiing can take place in all of the above areas, except perhaps for the escarpment. Cylcing is possible along the pathway.

A1.14.4 Public Access

Vehicular access is possible to within 10 to 30 m (25 to 100 ft.) of the river along Memorial Drive.

Pedestrian access to and along the riverbank is provided for along the entire length of the community's frontage on the river.

A1.15 BRIDGELAND-RIVERSIDE

(The left bank between the old Langevin Bridge and the Western Irrigation District weir)

A1.15.1 Residential Houses

The houses are generally old, small, single-family structures. About 20 properties (nine being City-owned) are approximately 60 m (200 ft.) outside the floodway limit. All these properties are in the floodplain.

There are 11 properties between Edmonton Trail and 6th Street N.E. The houses are 90 to 120 m (300 to 400 ft.) from the waterline and 60 to 90 m (200 to 300 ft.) outside the floodway limit. The rear property lines are 75 to 105 m (250 to 350 ft.) from the waterline and 30 to 75 m (100 to 250 ft.) outside the floodway limit.

A1.15.2 Multiple-Family Housing

All of these buildings are in the floodplain. There is a City-owned apartment building situated on 7A Street N.E. at McPherson Road. It is a new, 12-storey structure which is about 90 m (300 ft.) from the waterline and about 60 m (200 ft.) outside the floodway.

There is a City-owned senior citizen apartment development located between Bow Valley Drive and Memorial Drive which consists of nine, old one-storey buildings. The four buildings closest to the river are 60 to 75 m (200 to 250 ft.) from the waterline and 30 to 45 m (100 to 150 ft.) outside the floodway.

A1.15.3 Commercial

There is a City-owned gas station situated on the northeast corner of the southbound Edmonton Trail and McDougall Road. This one-storey building is approximately 90 m (300 ft.) from the waterline and about 60 m (200 ft.) outside the floodway. The property is just outside the floodplain.

A1.15.4 Industrial

The "Alberta Ice Co." is located on 6A Street N.E. on an approximate0.4 ha (one-acre) site. This old, two-storey building is about 105 m (350 ft.) from the waterline and about 75 m (250 ft.) outside the floodwayThe property line is 75 m (250 ft.) from the waterline and about 45 m (150 ft.) outside the floodway. The entire property is within the floodplain.

A1.15.5 Institutional

The "Lions Club of Calgary" have their offices on Provincial land located west of 11th Street N.E. on Memorial Drive. The modern, onestorey building is approximately 75 m (250 ft.) from the waterline and about 45 m (150 ft.) outside the floodway, but is within the floodplain.

The "Canadian National Institute for the Blind" is located on City land by Memorial Drive, between 11A Street N.E. and 12th Street N.E. The modern one-storey building is about 150 m (500 ft.) from the waterline and approximately 90 m (300 ft.) outside the floodway and just at the floodplain limit.

The new, concrete Zoo entrance building is situated by the riverbank at the north end of a pedestrian bridge at about the 14th Street N.E. alignment. The structure was completed in 1978 and is at the floodway limit.

A1.15.6 Established Parks and General Open Space

The "Calgary Zoo" occupies St. George's Island, the land between the river and Memorial Drive from Baines Bridge to Nose Creek, and the bluff north of Memorial Drive and east of 12th Street N.E. The area along the river between Baines Bridge and the 15th Street N.E. alignment is mainly used for parking and the entrance to the Zoo. The bluff and the riverbank between the 15th Street N.E. alignment and Nose Creek is occupied by paddocks for large zoo animals.

There is a very small, City-owned parkland between the two Langevin Bridges which has planted grass and trees, a pathway, and is within the floodway.

The City-owned strip of park along the river between the new Langevin and Baines Bridges averages about 30 to 45 m (100 to 150 ft.) in width. It has planted grass and trees, a dyke with a pathway, and is within the floodway.

There are small pieces of grassed City-owned openspace along the north side of Memorial Drive between the Southbound Edmonton Trail and 8th Street N.E.

A City-owned community sports field lies between 8th Street N.E. and the 9th Street N.E. alignment. It has the Bridgeland-Riverside Community Association building and facilities for active play and sports such as a rink and a baseball diamond. It is outside the floodway but within the floodplain.

There is a City-owned semi-natural area between the Zoo animal paddocks from the 15th Street N.E. alignment to Nose Creek. There are natural bush and trees, but the area has been disturbed by the presence of a gravel vehicle track. It is inside the floodway.

There is an approximately 4 ha (10 acre) piece of City park between the CPR Edmonton line, Deerfoot Trail, and the river. It has recently been landscaped and planted with some trees. It is partially inside the floodway. Active play is possible in this area.

Activities such as walking, jogging, and cross-country skiing can take place along the entire length of the publicly-owned riverbank in this area, although the Zoo entrance building and Nose Creek require detours in the eastern part.

A1.15.7 Public Access

There is vehicular access within 30 to 45 m (100 to 150 ft.) of the river along the major, four-lane Memorial Drive between Edmonton Trail and 12th Street N.E. but no stopping and parking is allowed. The Zoo access is at 12th Street N.E. where parking is provided about 15 m (50 ft.) from the river. There is also a gravel road extending east from the Zoo parking area to the river on both sides of Nose Creek.

A1.16 ALBERT PARK-RADISSON HEIGHTS, SOUTHVIEW, AND DOVER

(The left bank between the W.I.D. weir and the Millican CNR bridge)

A1.16.1 Residential

The Inglewood Motel and Trail Court has recently been relocated by the City and there are now no residences near the floodplain.

A1.16.2 Commercial

The "Inglewood Golf and Curling Club" makes use of a large area of City-owned land extending from 17th Avenue S.E. to about the 41st Avenue S.E. alignment. The clubhouse is a one-storey structure about the 26th Avenue S.E. alignment which houses the curling rinks and other social facilities. The entrance to the area for vehicles is from 17th Avenue S.E. The eastern part of the golf course has been utilized for the Deerfoot Trail extension.

There are two buildings located by Ogden Road at Bonnybrook Bridge which were formerly 'Imperial Oil' offices but are now owned by the City and leased to private firms. They are substantial one and two-storey structures situated about 30 m (100 ft.) from the waterline and just inside the floodway.

A1.16.3 Industrial

The area on the top of the riverbank from the 44th to 46th Avenue S.E. alignments is occupied by two railroad bridges and several tracks.

At about the 55th Avenue S.E. alignment there is another railroad track and its embankment which constricts access along the riverbank.

A1.16.4 Established Parks and General Open Space

There is a stretch of W.I.D. (Provincially) owned semi-natural open space from the W.I.D. weir to 17th Avenue S.E. and between Deerfoot Trail and the river. It widens from less than 15 m (50 ft.) by the weir to about 180 m (600 ft.) at the south end. There are naturally-forested areas which have been disturbed by several informal vehicle roads. There are only trails for people and no other facilities exist.

A City-owned vacant area along the river between 17th Avenue S.E. and 22nd Avenue S.E. alignment was formerly an industrial site. It is now being filled with earth piles and the only vegetation is on the bank. There is no well-used trail.

The "Inglewood Golf Course" is a City-owned, privately-operated area between the river and the canal and between 17th Avenue S.E. and 41st Avenue S.E. alignment. It has an 18 hole golf course and indoor curling rinks. The riverbank between the Clubhouse (at about the 26th Avenue S.E. alignment) and the southern end of the golf course has manicured fairways and greens. Along the eastern edge of the golf course is the canal, separated from it by a high dyke with large trees and a well-used trail. At the southern end of the golf course there is a marshy and forested area, with only one well-used trail.

A large area of land between Bonnybrook Bridge and the 58th Avenue S.E. alignment was formerly the "Imperial Oil Refinery" site, but it has been bought by the City and cleared of most of the buildings and tanks. The Deerfoot Trail will cut through this area and cross the river at about the 50th Avenue S.E. alignment - construction is scheduled to be completed by 1980. There is an area along the river in the northwest part of the site which had no industrial uses and is at present covered with natural grasses.

Passive activities like walking, jogging, and skiing are possible along the riverbank north of the 17th Avenue S.E., and in the golf course during the winter. The dyke along the irrigation canal is especially good for these activities, whereas the natural, marshy areas at the southern end of the golf course are less so. The "Imperial Oil Refinery" site was formerly private with no public activities allowed along its stretch of the river; however, access is now possible onto the cleared site.

There are no riverside park facilities and no hard-surfaced pathways for cycling.

A1.16.5 Public Access

Vehicular access to within 3 to 30 m (10 to 100 ft.) of the river between the weir and Cushing Bridge is along an informal gravel track. A paved road leading south from 17th Avenue S.E. to the Golf Clubhouse is private. It approaches to the top of the riverbank. Ogden Road - a main paved road - crosses the river at Bonnybrook Bridge, but there are no formal public parking areas available.

Pedestrian access to and along the river is possible on trails north of 17th Avenue S.E. and without trails on the landfill site south of 17th Avenue S.E. and on the cleared industrial site between Bonnybrook Bridge and Millican CNR bridge. Access along the river by the Inglewood Golf Course is possible in the winter but riverside access is not allowed in the summer. However, alternative access is possible along the dyke by the canal between 17th Avenue S.E. and Bonnybrook Bridge.

A1.17 MILLICAN-OGDEN

(The left bank between the Millican CNR bridge and Graves Bridge, S.E.)

A1.17.1 Residential

Between the 59th and 66th Avenues S.E. alignments the private property lines and houses are about 90 to 120 m (300 to 400 ft.) away from the top of the river escarpment. Between the 66th Avenue S.E. alignment and Glenmore Trail the private property lines and houses are about 15 to 60 m (50 to 200 ft.) from the top of the escarpment. These houses are new single-family dwellings and condominiums and are a part of the new subdivision of "Lynnwood". There are no residential uses closer to the river than these.

A1.17.2 Established Parks and General Open Space

There is an undisturbed natural area of about 4 ha (10 acres) between the top of the escarpment and the river from the Millican CNR bridge and a fence at the 58th Avenue S.E. alignment. This area is owned by a development company 'Devon Estates'. It has a trail and is heavily treed.

"Beaverdam Park" is an established City-owned natural park of about 16 ha (40 acres) between the foot of the escarpment and the river. It is mostly treed with underbrush but there are some clear areas near the centre of the park where there are picnic and active play facilities. There is only pedestrian and bicycle access down the escarpment on a gravel roadway. Pedestrian access is also possible from the north and south along the riverbank.

The riverine escarpment between the CNR tracks and about the 62nd Avenue S.W. alignment is forested and is about 25 m (75 ft.) high and has about a 1:2 slope.

The escarpment between the 62nd Avenue S.E. alignment and Glenmore Trail is largely bare of trees, with only grass and brush. It varies from about 20 to 25 m (60 to 80 ft.) in height and varies in slope from 2:5 to 3:5. South of about the 70th Avenue S.E. alignment there is some flat land at the foot of the escarpment with grass and some groves of trees.

Activities such as walking, jogging, and cross-country skiing can take place below the escarpment between the CNR tracks and the southern end of the park, and along trails on the escarpment's slope from the south to Glenmore Trail.

A1.17.3 Public Access

Vehicular access is not possible to the river. However, access is provided for to within 90 m (300 ft.) of the top of the escarpment along the minor Lynnview Road and to within 15 to 30 m (50 to 100 ft.) along Lysander Drive and Ogden Drive.

Pedestrian access is on trails along the riverbank and the escarpment which extends the entire length of this part of the river. The main pedestrian access point to Beaverdam Park is at 62nd Avenue S.E.

A1.18 BURNCO-CANFARGE AREA

(The left bank between Graves Bridge and the 114th Avenue S.E. alignment)

A1.18.1 Residential

An approximately 2 ha (5 acre) parcel owned by L. Mackie is located at the southern end of Carburn Park between the 90th Avenue S.E. alignment, 15th Street, and the river. There is a house, some farm buildings, and some cattle - which are being grazed on public land. Two of the larger farm buildings are less than 30 m (100 ft.) from the waterline and are inside the floodway. The property line extends to the waterline and the entire parcel is within the floodplain.

A1.18.2 Commercial

The "Buoy Busters" - a private model boat racing club - makes use of an artificial 2 ha (5 acre) lagoon owned by the Province which is located immediately downstream of Graves Bridge. This lagoon is separated from the river by a 15 to 25 m (50 to 75 ft.) wide dyke, and is entirely inside the floodway limit. The only structure is a pit toilet on the dyke. Road access is from Glenmore Trail at about the 20th Street S.E. alignment.

There are travel trailers for sale on the Mackie property.

A1.18.3 Industrial

"Burnco" owns a large area of land between Glenmore Trail and the 90th Avenue S.E. alignment. The ownership extends to the waterline only between the "Buoy Busters" lagoon and Carburn Park. The property is vacant land with some grass and trees, but is mostly disturbed by several gravel extraction works, truck roads, and a few garbage dumping spots. Most of the property is outside the floodplain limit.

"Consolidated Concrete" owns a large parcel of land which includes the riverbank between the 90th and 98th Avenue S.E. alignments. There is an asphalt plant located at about the 94th Avenue S.E. alignment about 300 m (1,000 ft.) from the waterline and about 270 m (900 ft.) outside the floodway. Immediately east of this plant is a large sand and gravel extraction area. In the southwest corner of the property is a fenced truck storage area which is about 30 m (100 ft.) from the waterline and is at the edge of the floodway limit. There is a narrow strip of natural vegetation on the riverbank in this property. A large part of the parcel is within the floodplain.

"Canfarge" owns a large area of land which includes the riverbank between the 98th and 114th Avenue S.E. alignments. The land is generally disturbed and excavated for gravel and sand-extraction operations. There is also a pre-cast concrete plant located at about the 96th Avenue S.E. alignment, about 1 km (3/4 mile) from the river. In the northwest corner of the property, and near the southwest corner are fenced truck and equipment storage areas and sheds. These two areas are located about 15 m (60 ft.) from the waterline and are mostly inside the floodway. At about the 100th Avenue S.E. alignment is a small building located at the riverbank with a water connection to the river. Canfarge has a bridge at about the 107th Avenue S.E. alignment which connects their property on both sides of the river.

A1.18.4 Established Parks and General Open Space

The lagoon immediately downstream of Graves Bridge is owned by the Province. There are some trees and grass surrounding it and private vehicle tracks along both sides.

The escarpment on the east side of this lagoon is owned by Burnco. It has a slope of about 1:2 and a height of about 20 m (60 ft.), and is covered with large natural trees.

"Carburn Park" is an established City park of about 20 ha (50 acres) with an adjacent natural area of about 10 ha (25 acres) which is owned by the Province. Active play and informal sports can take place in the open, grassed areas of Carburn Park. Activities such as walking, jogging, and cross-country skiing can take place informally throughout this Park, although no facilities exist. Most of the inland portion is City-owned and is open, semi-natural grassland and most of the natural forested area along the river is owned by the Province. Public road access - which is not advertised - is from Glenmore Trail via 82nd Avenue S.E. and 15th Street S.E. There is a forested island at the west side of this park which is owned by the Province and to which there is no access.

There is approximately 5 ha (13 acres) of natural and semi-natural area located by the river on Canfarge land between the 98th and 110th Avenue S.E. alignments. This low area is largely covered with natural trees and the eastern part has been disturbed by various human activities. The Canfarge bridge crosses the river in the southernmost part of this area.

A1.18.5 Public Access

The only public road in this area leads west from Glenmore Trail to 82nd Avenue S.E. and south of 15th Street S.E. (both of which are paved), with vehicular access to riverbank possibly only between the 92nd and 96th Avenues S.E. alignments.

Pedestrian access to the river is possible in Carburn Park and by the road between the 92nd and 96th Avenues S.E. alignments.

A1.19 THE C.I.L.-DAON AREA

(The left bank between the 114th Avenue S.E. alignment and the City Limits)

A1.19.1 Industrial

"Canadian Industries Limited" ("C.I.L.") owns a large area of land and the entire riverbank in this area of the river. The explosives plant is located at the 114th Avenue S.E. alignment, about 1 km (3/4 mile) from the river. This plant is to be relocated. The future Deerfoot Trail will probably cross the river near the 112th Avenue S.E. alignment and extend in an east-southeasterly direction across C.I.L. land to the Barlow Trail.

The highway will pass close to the present site of the plant and the C.I.L. will relocate before the highway is constructed. Land use feasibility studies are presently being done for C.I.L. with respect to the future use of their land.

A1.19.2 Established Parks and General Open Space

Daon Development Corporation own all the land south of 114th Avenue S.E. extruding to the City Limits with the exception of the 18 ha (45 acre) Patterson farm which is situated opposite the new Deer Run residential development.

There are treed areas bordering the river between the 114th and the 130th Avenue S.E. alignments and an approximately 20 ha (50 acre) forest adjacent to the riverbank between the 120th and the 126th Avenue S.E. alignments, all of which appear to be natural and undisturbed.

Between the 130th and the 146th Avenue alignments there is a naturally vegetated escarpment adjacent to the river.

An island of about 6.5 ha (16 acres) is located at about the 138th Avenue S.E. alignment and is covered with trees.

In the southern portion of this area there are two naturally treed areas on the inside of a river meander at the 162nd Avenue S.E. alignment and immediately adjacent to the river north of Highway 901 (22).

At the top of the escarpment the land is under cultivation.

Although there are large open spaces and treed areas near the river; the area is privately-owned and there is no public access.

A1.19.3 Public Access

There are four public roads which give access to this area: 24th Street S.E., Barlow Trail, 114th Avenue S.E. and Highway 901 (22). However, all this land is private.

A2 LAND USE ANALYSIS

A2.1 BOWNESS

A2.1.1 General Description of the Community

Bowness possesses natural boundaries - the river to the north and east and the riverine escarpment to the south and west. It is a family residential area which existed as a separate community before being annexed by the expanding City of Calgary in 1964. In recent years the higher income segment of the population has expanded.

The major thoroughfare in this area is Bowness Road which crosses the river at the northwest and southwest extremities of the community, via 85th Street N.W. at the 85th Street Bridge and at the Shouldice Bridge respectively. The main commercial area extends along the Bowness Road between 63rd Street N.W. and 78th Street N.W. Throughout most of the community minor streets parallel the course of the river but are separated from it by private properties.

To the north of 48th Avenue N.W. there has been some new development on recently subdivided existing large R-1 lots. To the east of the CPR tracks the land adjacent to the river is dominated by single-family residences - most of which are older residences, but there has been some recent infilling. There are two major areas of the community affected by the floodplain. These lie between the Twin Bridges and the 66th Street N.W. alignment and between the 66th Street N.W. alignment and a point 500 feet downstream of the Shouldice Bridge. There are approximately nine houses situated within the floodway and 350 within the floodplain. In addition, the floodplain affects a few apartments, commercial buildings, the Bowcrest Nursing Home and the German-Canadian Club.

A2.1.2 Relationship to the River

As Bowness is bound by the river on three sides and as Sarcee Trail is the only connection to other parts of the city which does not cross the river, there appears to be a strong awareness of the river by residents of Bowness. However, visual access to the river is strictly limited to the bridges and other isolated points of access - except for the few who live immediately adjacent to the river.

New subdivisions in Bowness have departed from the traditional pattern of residential monopoly of the riverbanks. The riverbank areas of Bow Green, Bow Village and Bowmont Crescent have been dedicated as public reserves, thereby increasing an awareness of the river in these areas.

A2.1.3 Public Access to the River

Public access along the Bowness riverbank is more restrictive than in any other community located by the Bow river. There is pedestrian access to the river at eight small isolated areas which are suitable only for passive recreational activities such as fishing. Due to the extensive sketches of privately-owned riverbank there is no continuity of access to or along the river. Except at the bridges, there are no roads adjacent to the river and vehicular access doesn't exist.

Bowness Park partially compensates for the lack of access elsewhere in the community. The park occupies a large island, extending from a point approximately 400 m east of the 85th Street bridge, upstream beyond the City limits. This is a major family recreational area serving predominantly the northwestern portion of the city. There is also a strong community orientation towards the park. The park receives intensive weekend use throughout the year, the most popular activities being picnicking, walking, boating, cycling, fishing, ice-skating and crosscountry skiing. The park provides several facilities - shelters, picnic tables, barbecue stands, toilets, a bandstand, miniture train track, night lights, a small amusement park and childrens play facilities. Formal vehicular and pedestrian access exists at one point on 48th Avenue N.W. which becomes something of a bottleneck during periods of heavy use. Informal pedestrian access exists from the 85th Street N.W. causeway and via city owned land near the 80th Street N.W. alignment.

Upstream of the park a dirt trail traverses the riverine escarpment, extending out of the City limits to Happy Valley Park. This area presently receives little use. The proposed Northwest By-Pass would cross this area. (Bowmont Design Brief, August 1978)

A2.1.4 Condition of the Riverbank Area

Upstream of the CPR Twin Bridges and downstream of the Shouldice Bridge the high, steep riverbank has sparse vegetative cover. Between these bridges, and in Bowness Park, the riverbank is mostly less than 2 m in height and covered with natural brush and trees. The majority of Bowness Park is covered with manicured grass and large trees with natural vegetation at the eastern and western extremities. The escarpment upstream of the park is heavily wooded, with Balsam Poplar, Douglas Fur and White Spruce. Groves of aspen are found towards the top of the escarpment.

There is an artificial riverbank dyke between Bowbank Crescent and Shouldice Bridge.

A2.2 WILDWOOD AND EDWORTHY PARK

A2.2.1 General Description of the Community

Wildwood is predominantly a single family residential community developed in the mid 1950's on a plateau above the Bow River. For the purposes of this report the river defines the northern edge of the community and both the escarpment to the west and Edworthy Park are included.

As the community is well-defined by both natural features and the Bow Trail, it is stable and not subject to growth pressures. Spruce Drive is the main collector street and Wildwood Drive an important local street that parallels the escarpment edge. The City retains a transportation option concerning linkage of the Crowchild and Bow Trails via Shaganappi Trail (Bowmont Design Brief, August 1978). If constructed the Shaganappi Trail extension would pass through Edworthy Park significantly affecting its present character.

The only significant area of flat land adjacent to the river is an approximately 30 ha (75 acre) portion of Edworthy Park, situated at the base of the escarpment north of Wildwood. Downstream of the Park the escarpment is City-owned whilst upstream below Sarcee Trail it is private, containing 3 large houses.

A2.2.2 Relationship to the River

Wildwood's portion of the riverine escarpment averages about 70 m in height with a slope of between 1:3 and 2:3. This is one of the highest stretches of escarpment in the city.

To the north of Wildwood Drive rows of private single family houses are interspersed by stretches of open space in a ratio of 3:2 respectively. Good views of the river valley are therefore available but because they are intermittent Wildwood Drive is not significant as a scenic route and receives predominantly local use. To the west of the community panoramic views of the river valley are to be had from Sarcee Trail.

A2.2.3 Public Access to the River

The only vehicular access to the riverside area is via Spruce Drive and down the Edworthy Park entrance road to the parking area between the base of the escarpment and the CPR tracks.

Steep pedestrian trails lead down to the river from the open spaces on Wildwood Drive but the main pedestrian routes to the Park are down the entrance road and the toboggan run area immediately to the east. The Boothman pedestrian bridge provides access to the Park for the residents of Montgomery, Point Mackay and Parkdale.

To the west of the main ravine the escarpment is covered with mixed forest and crossed by trails which have extensive views of the valley. The Park's plateau area is covered by trails used by hikers and crosscountry skiers. On the Douglas Fir Escarpment which extends eastwards from the park, the 'Douglas Fir Trail' provides continuous pedestrian access along the escarpment as far as the Shaganappi Golf Course. This trail is a very important link in the pathway system on the Bow River. Upstream of the Park, private property and the location of the CPR tracks at the foot of the escarpment limit pedestrian access.

A2.2.4 Condition of the Riverbank Area

Most of the vegetation in the Edworthy Park floodplain has been modified by past farming activities. The strip of riverine forest along the riverbank is the only remaining natural vegetation. The height of the riverbank varies between about 3 m and 12m, generally increasing in height towards the upstream boundary of the community.

A planted windbreak of Blue Spruce in the centre of the Park shelters picnic facilities and an outdoor ice-skating rink. Downstream of this facility is a grassed field and to the upstream, a tree nursery.

Edworthy Park, the Douglas Fir escarpment and Lowery Gardens together consititute a most valuable natural area which has a diverse population of plants and wildlife.

A2.3 SPRUCE CLIFF AND LOWERY GARDENS

A2.3.1 General Description of the Community

Spruce Cliff is a residential area composed of mixed housing developments. To the west of the main community thoroughfare, Spruce Drive, are single family areas, classified R-2, which date from the mid 1950's. To the east are newer low-rise apartment buildings and condominiums on R-3 land. Development extends to the top of the riverine escarpment and the official community boundaries to the CPR tracks. For the purposes of this report the area includes both the Shaganappi Golf Course and the flood plain area north of Spruce Cliff called "Lowery Gardens".

A2.3.2 Relationship to the River

The land use in this area is most fragmented. The Spruce Cliff community is located on the western half of the escarpment whilst the municipal Golf Course occupies the eastern portion. The escarpment separates the community and the golf course from the river and the CPR mainline separates Lowery Gardens from the base of the escarpment.

Together with the Wildwood area the escarpment in this reach is one of the highest varying in height from 60 m in the east to 70 m in the west. The slope varies from a steep 1:2 by the residential area to a much more gradual 1:5 by the golf course.

In Spruce Grove an almost continuous row of private properties border the escarpment thereby blocking views of the river valley to the majority of residents in the community. The golf course also prevents viewing as the river cannot be seen across it and no public access is permitted.

The edge of the escarpment can be reached at 24th Street N.W. and 37th Street N.W. - the eastern and western limits of this area. Parking space exists and there are good views of the valley.

A2.3.3 Public Access to the River

The steepness of the escarpment prevents direct vehicular access to the river from the community. A gravel road within the CPR right-of-way extends westwards along the riverbank from 9th Avenue N.W. to Lowery Gardens. It is closed to private vehicles.

A number of pedestrian trails lead down to the river from gaps in the pattern of private ownership at the top of the escarpment and from 24th Street N.W. and 37th Street N.W. The Douglas Fir Trail, maintained by Parks and Recreation, connects with these informal trails as it continues along the escarpment.

Only service vehicles are allowed into Lowery Gardens via the westward extension of 9th Avenue S.W. Pedestrian access is possible via this route. Upstream of Lowery Gardens pedestrian access along the riverbank is both difficult and dangerous due to the presence of the CPR tracks.

A2.3.4 Condition of the Riverbank Area

The riverine escarpment is covered primarily with a mixed Douglas Fir and White Spruce forest which is only marginally affected by the presence of pedestrian trails. Below the eastern part of the golf course the slope has been partially cleared. Known as the Shaganappi Slopes this area has some Balsam Poplar, a ski tow and a few short ski runs.

Lowery Gardens is situated on the floodplain below the escarpment. The area has a lengthy history and has been subjected to various forms of land use. Large parts of the area are covered with riverine forest and the area supports a diverse range of flora and fauna. However parts of the area have been disturbed and unauthorized dumping has taken place in the past. The Calgary Field Naturalists Society recommend that the Gardens be dedicated as a park and that the damaged areas be rehabilitated (Natural Areas, 1973; p. 76). The riverbank is low in this area with deposition taking place on the inside curve of the river.

Upstream of Lowery Gardens the presence of the CPR mainline close to the river prevents any significant vegetation growth. Downstream of the Gardens a gravel road separates the tracks from the river and there is riverside tree growth.

Three islands lie off shore of Lowery Gardens. Two are basically gravel base. The third "Archers Island" is just over 10 acres in size and supports mixed shrub. Recently the island was partially excavated for fill used in the construction of the Crowchild Trail/Memorial Drive interchange.

A2.4 SUNALTA

A2.4.1 General Description of the Community

Sunalta is an old community with large residential and industrial components. 10th Avenue S.W. is the approximate boundary between these differing land uses.

The population density of the residential area is increasing, probably due to the R-4 classification, in 1977 it was 3,163. In 1974 about 60% of the housing stock had been built before 1920. Redevelopment pressure is currently resulting in the deterioration and demolition of large numbers of these houses and the construction of low-rise apartment and condominium buildings, particularly along 11th and 12th Avenues S.W.

A2.4.2 Relationship to the River

The residential part of Sunalta is located over 300 m from the river. The interposing land consists of transportation arteries and commercial and industrial land uses.

In the past, the area between the CPR tracks and the river was industrial land. In the late 1960's Bow Trail was constructed, dividing this area and disrupting the riverbank. Present land uses in the area from east to west are: a number of old warehouses by 14th Street S.W.; two large car dealerships; a city snow dump; an area of parkland surrounding the "Pumphouse Theatre" (a Provincially designated historic site); and a group of commercial holdings close to Crowchild Bridge. South of the CPR tracks along 10th Avenue S.W. is a row of small commercial/warehousing businesses interspersed with a few houses.

The unsightly combination of buildings, tracks, roads, bridges and embankments physically and visually separates the residential community from the river.

A2.4.3 Public Access to the River

There is no direct vehicular access between the residential community and the riverbank. Bow Trail, 9th Avenue S.W. and 10th Avenue S.W. approach close to the river and parking is possible on the latter two.

Pedestrian access to the riverbank is poor as major transportation routes and private property have to be crossed. There is a red shale pedestrian pathway along the top of the riverbank which passes under both the Crowchild and Mewata Bridges. It is an important link in the almost continuous pedestrian system extending along the right bank of the river between Edworthy Park and the Inglewood Bird Sanctuary but receives little local use.

There are no pedestrian walkways on the Crowchild Bridge. Thus there is no pedestrian access across the river between the Boothman and Mewata Bridges. Because access is difficult, little use is made of the right bank trail system by residents of the communities on the northern side of the river. The attractive Pumphouse area is therefore little used as it is also isolated from the communities to the north. Consequently it's potential as envisaged in the "Bow River Beautification Plan" and Parks/Recreation Department proposals, has not been realized.

A2.4.4 Condition of the Riverbank Area

This is one of the more urbanized reaches of the Bow River and the condition of the riverbank area is generally poor. The only improved area is the Pumphouse Theatre and it's surrounding grounds. This area is visually attractive and the riverbank is treed. Unfortunately, the adjacent City snow dump, proximity of the CPR tracks and the industrial area to the south have a negative impact on the area.

Beneath and immediately upstream of the Crowchild Bridge's elevated southern end the riverbank area is barren and unimproved. No vegetation screens the railway tracks and a group of commercial buildings are located very close to the river.

Downstream of the snow dump natural vegetation separates and screens the car dealerships from the riverbank trail. Nothing softens the impact of the Bow Trail which runs immediately adjacent to the riverbank for about 450 m. The red shale pathway is sandwiched between the roadway and the riverbank. There is very little vegetation and no shielding from the noise and fumes of the traffic and the unsightly warehouses beyond the highway. The riverbank is barren, precipitous and rip-rapped. The appearance of this stretch of the river is equally unpleasant from the opposite riverbank.

A2.5 THE DOWNTOWN AREA: INCLUDING EAU CLAIRE AND CHINATOWN

A2.5.1 General Description of the Area

The downtown area has long been characterized by an expanding retail and office core surrounded by old single-family residential communities. More recently the rapid expansion of the core, coupled with high-rise residential development, has destroyed most of the residential areas leaving enclaves in the west end and Eau Claire and Chinatown. Comprehensive redevelopment is nowing occurring in Eau Claire. Land uses next to the river vary considerably. Low-density residential housing used to exist upstream of 3rd Street S.W. interspersed with higher density residential housing, commercial/institutional and parking uses, separated from the riverbanks by streets. Downstream of 3rd Street S.W. and adjacent to the riverbank were predominantly commercial and light industrial uses. Presently areas of single family housing have been cleared and redevelopment will probably be high density residential because of the predominantly R-5 classification. Parts of the commercial/industrial riverbank owned by the City have been cleared and developed as parkland.

The Eau Claire community abuts the river between 2nd Street S.W. and 8th Street S.W. About half the community has been demolished for redevelopment and most of he rest has deteriorated. The 1977 population was 399. Chinatown adjoins the river between 2nd Street S.W. and 2nd Street S.E. Deterioration and redevelopment are also characteristics of this area. In 1977, the population was 299.

The Planning Department has produced design briefs for both areas. The policy in both areas is for strong residential components in the new developments. The eventual target populations for Eau Claire and Chinatown are 8,000 and 4,000 respectively (Eau Claire Design Brief, Calgary Planning Department, approved City Council August, 1974; Chinatown Design Brief, Calgary Planning Department, approved City Council November, 1976)

All downtown streets have 'major' status, but these paralleling the riverbank between 7th Street S.W. and 11th Street S.W. and between Centre Street and 6th Street S.E. do not carry heavy traffic loads.

The floodplain area covers approximately 40 blocks in the downtown area, including virtually all Eau Claire and Chinatown. The floodway is confined to the riverbank.

A2.5.2 Relationship to the River

Most of the riverbank land uses are oriented away from the river. Good examples are the old bus garage at 2nd Street S.W. and deteriorating warehouses near the Langevin Bridges where the riverbank was completely neglected until recently.

Princes Island and the two blocks between 9th Street S.W. and 11th Street S.W. are the most positive stretches of the riverbank. Both areas are river-oriented, the former is an urban park and the latter a residential street facing a treed riverbank park.

Redevelopment will improve the quality of the riverbank. The Eau Claire Design Brief specifies a 200 foot open space development setback for new residential development north of 2nd Avenue S.W. The proposed large resident population will have a close unhindered connection with the riverbank area. The Chinatown Design Brief contains similar provisions. It is also proposed to convert 3rd Street S.W. into a pedestrian mall. This should strengthen the link between the core area, the riverbank and Prince's Island. In the Langevin Bridges area the proximity of the core and M-1 classification will probably result in retail or service developments, possibly with a residential component. The new federal office building is oriented towards the river and with possible pedestrian connections with the riverbank park, may set an example for development.

The proposed eastward extension of Bow Trail to 9th Street S.W. is a negative development. Presently the streets paralleling the riverbank are narrow and not heavily used. A close relationship exists between the community and the river. This situation would be reversed if the extension is constructed. Construction is scheduled for 1982 along the top of the riverbank.

A2.5.3 Public Access to the River

Vehicular access close to the riverbank exists between 7th Street S.W. and 11th Street S.W. and between Centre Street and 6th Street S.E. Generally light traffic volumes permit leisurely driving and temporary parking. Physical and visual access to the riverbank is intermittently blocked by buildings. Large public parking areas adjacent to the riverbank at 8th Street S.W., 4th Street S.W. and 3rd Street S.E. are utilized both by communities and recreationalists. Unfortunately the parking areas are not screened and encroach unaesthetically upon the riverbank.

The entire length of the riverbank in the downtown area is owned either by the City or the Province and there are no legal or physical restrictions to pedestrian riverside access. The Parks Recreation Departments red shale pathway continues throughout the reach. Access from the core is more difficult as the necessity of continually crossing wide, busy streets acts as a barrier in itself.

There are five road bridges and three pedestrian bridges in this reach of the river: all of the road bridges also provide pedestrian access across the river. Stairways have recently been constructed under the Louise and Centre Street Bridges so access along the riverbank is now uninterupted.

A2.5.4 Condition of the Riverbank Area

An open space strip runs almost continuously along the top of the downtown riverbank. Some sections are maintained and planted, others are not. Two major formal parks - Prince's Island and Fort Calgary Park - are landscaped and manicured containing facilities such as parking lots and toilets. The partially reconstructed Fort Calgary is a Provincially designated historical site. There is also a large semi-natural area between the Louise Bridge and Princes Island. This contains a parking area and a heliport but retains a dense Balsam Poplar forest and a natural river edge, unique in the downtown area.

There are two notable disturbed areas. The City snow dump by Mewata Bridge is barren and vacant in the summer and always presents a barren appearance. "Eau Claire Estates" have demolished approximately three blocks of houses opposite the western part of Princes Island and the resulting barren land constricts the riverbank green space.

Narrow and confined strips of open space can be aesthetically pleasing. The riverbank upstream of Louise Bridge is screened from the street and planted with bushes and large trees. The result is an attractive strip of parkland with good river views.

Excepting the two park areas, the downtown riverbank is relatively high and steep. There are disruptive areas of concrete rip-rap but for the most part the riverbank supports unkempt poplars and brush which form a natural edge to the downtown.

A2.6 INGLEWOOD

A2.6.1 General Description of the Community

Inglewood abuts the Bow River in the north and east and the Elbow River in the west. It is the only community with frontage on both rivers. For the purposes of this report the industrial area to the south, which extends to the Bonnybrook Bridges, is included.

The community is one of the oldest in Calgary. In 1974 about 56% of the buildings had been constructed prior to World War One and only 1% since 1960 (Established Communities in Calgary, 1974). There are more historically significant houses in Inglewood than any other residential community - five are Provincially designated and the City has identified several more.

In Inglewood, single family residential areas are interspersed with commercial and industrial uses resulting in severe conflict. Established Communities in Calgary (1974) identified visual, noise and odour problems. Inglewood's main commercial street, 9th Avenue S.E., and Blackfoot Trail are major transportation routes passing through the community.

The area's residential land classification is R-2. New development is limited to some new duplexes and illegal 'four-plexes' and the population declined about 10% in the 1973 to 1977 period despite implmentation of the "Residential Rehabilitation Assistance Program". The Inglewood Design Brief (Calgary Planning Department August 1973) proposed reclassification of riverside industrial land. Subsequently some small industrial areas have been reclassified R-3A to promote family-oriented housing.

In the City of Calgary only Hillhurst-Sunnyside would be more seriously affected by a major flood. Most of Inglewood is located in the floodplain. In 1974 some 590 residential structures and 60 commercial structures were affected. The floodway limit affects open space and some industrial land.

A2.6.2 Relationship to the River

The nature of Inglewood's relationship to both rivers has recently changed due to the 1973 design brief and the 'Neighbourhood Improvement Program' designation. An Inglewood design brief policy to preserve and enhance the riverbank is almost realised. Most of the riverbank CNR tracks have been removed and improvements made to open space between industries and the river.

Present riverside land uses vary greatly in type, condition and orientation. Residential properties face towards and away from the river but only 13 lots extend to the river. Industries occupy large riverside areas but none own the riverbank. Large open spaces immediately adjacent to the river are connected by strips of open space.

The community is well endowed with regional scale park areas with limited open space elsewhere. Despite the generally favourable amount of riverside open space the configuration of the residential area is such that the community is not oriented towards the river.

A2.6.3 Public Access to the River

There is vehicular access close to the river throughout much of the reach. The largest open space areas - Pearce Estate and the Inglewood Bird Sanctuary - have obscure access roads and parkway areas located away from the river.

There are eight bridges along this reach of the Bow and Elbow Rivers. Almost all pass over pedestrian trails and the road bridges allow pedestrian access across the river. The old dilapidated bridge across the Elbow River at 9th Avenue S.E. is due for replacement in the early 1980's. The community's design brief calls for construction of pedestrian bridges across the Bow River to enhance the riverbank pathway system.

Riverbank pedestrian access has been improved by partial riverbank rehabilitation and construction of the red shale pathway which continues into the reach and terminates at the Inglewood Bird Sanctuary. Both improvements were recommended in the design brief.

9th Avenue S.E. and the Blackfoot Trail primarily affect pedestrian circulation between the residential areas and do not greatly impair pedestrian access to the riverbanks. The minor streets closest to the rivers do not block pedestrian access to the riverbank.

A2.6.4 Condition of the Riverbank Area

The height and slope of the riverbanks vary considerably in this reach of the river. They are mostly covered with vegetation, forming a natural edge to the community. A major exception is the Bow's riverbank at 12th Street S.E. where the riverbank has been reinforced with boulder rip-rap in accordance with recommendations made by the Montreal Engineering report (1973).

The eastern part of Fort Calgary Park and the downstream riverbank have been recently cleared of buildings and railway tracks and landscaped as formal park. Pearce Estate has been established as a park with emphasis on passive family recreation. The riverbank has been largely unaffected retaining a natural cover of mixed shrub and poplar. The Inglewood Bird Sanctuary is a very valuable public natural area which is a habitat for many plant, bird and mammal species. The riverbank is in a natural state and screened from the high CNR embankment (which restricts the size of the sanctuary) by the extensive CPR Alyth yards.

A2.7 BONNYBROOK BRIDGES - GLENMORE TRAIL AREA

A2.7.1 General Description of the Area

All riverside land in this reach is occupied by industrial or agricultural uses. This pattern of land use is characteristic on both sides of the Bow River in the south east portion on the City.

The industrial operations are the City's Bonnybrook Sewage Treatment Plant and the 'Burnco Industries' sand and gravel complex. The agricultural operations are an extensive feed lot and tree nursery, both situated on City-owned land. These land uses will be removed as the planned Deerfoot Trail alignment passes through the area. The St. Dunstans Indian Industrial School is a site of historic interest which is not yet designated. It is situated close to the river south of the Bonnybrook Bridges.

Most of the aforementioned land uses are situated in the floodplain which extends a fair distance from the river due to the low lying nature of the land. There are a few old frame buildings within the floodway which are to be removed due to construction of the Deerfoot Trail.

A2.7.2 Relationship to the River

The Burnco operation visually dominates this reach of the river. Particularly noticeable are the piles of sand and gravel, located close to the riverbank and over 10 m (30 ft.) high. The other uses only require a few low-lying structures.

There is no active relationship between city residents and this stretch of the riverbank. Although largely owned by the City, casual observation of the area gives the impression of private ownership and use. No streets or open spaces are oriented towards the river and it is necessary to use the 'Millican - Ogden' escarpment on the opposite bank to view this side of the river.

A2.7.3 Public Access to the River

A few major routes enter the valley, serving industrial and commuter traffic. An industrial road, 15th Street S.W., provides the only vehicular access to the floodplain. There is no physical or visual contact with the river as it is separated from the riverbank by both industrial and agricultural activity. Construction of the Deerfoot Trail freeway will take place in the floodplain. Apart from its primary function as a major commuter corridor the new route may also have a parkway role. One minor street is planned to give access past the freeway to the riverbank.

There is no formal pathway along the riverbank in this reach. Riverside open space exists by the Bonnybrook sewage plant but its potential is ignored and the land abused by vehicles. Recent dedication of floodway land north of Burnco may herald improvement of this neglected reach.

There is a pedestrian connection across the river at Ogden Road's Bonnybrook Bridge which allows casual contact with the river. Downstream of this bridge there are no more pedestrian crossings across the Bow River within the City - a distance of about 15 km (10 miles). Pedestrian access will be provided beneath the western end of the Deerfoot Trail bridge.

A2.7.4 Condition of the Riverbank Area

Covered with natural trees and shrubs, the riverbank is generally low and passable on foot. A major exception is the Burnco area where extensive areas of riverbank are inadequately screened. Presently access is easiest on the land above the riverbank. Vegetative cover on land adjacent to the riverbank has been altered by industrial and agricultural activities. There are open spaces not under active use to the east of the sewage plant and to the south, where the Deerfoot Trail extension will cross the river.

An approximately 3 ha (7 acre) area of river flats south of Bonnybrook Bridge has a dense cover of tall shrub and is the only large natural area in this reach. The relatively isolated area by the Millican CNR bridge is subjected to some garbage dumping. This natural area includes a small creek and river flats.

A2.8 GLENMORE TRAIL - QUEENSLAND DOWNS AREA

A2.8.1 General Description of the Area

This is a long complex section of floodplain land extending from Glenmore Trail to the Fish Creek Provincial Park boundary. There are two major industrial complexes but most of the riverside land is in open space uses. A steep, high riverine escarpment divides the area from five residential communities located to the west.

There are four general areas within the floodplain. "Cominco" owns an extensive tract of land occupied by a manufacturing plant and the largest privately owned natural riverside area in the City. South of Cominco 'Side Hill' is a large area of undeveloped escarpment and floodplain land. The City recently purchased the land from 'P. Burns Ranches' to be partially used for the proposed Deerfoot Trail extension. Downstream of Side Hill 'Canfarge Ltd.' is a sand and gravel extraction operation occupying the whole floodplain. Finally, the 'Queensland Downs' community is situated at the top of the escarpment close to the river. Covered with natural coniferous forest, the steep escarpment slopes directly into the river.

A2.8.2 Relationship to the River

The communities of Fairview, Acadia and Willow Ridge are physically and visually separated from the river by the Blackfoot Trail and Maple Ridge Golf Course. The river is not visible from Blackfoot Trail because of the height of the escarpment. The Lake Bonavista Downs and Queensland Downs communities are separated from the river only by the escarpment which partially blocks views of the valley.

The proposed Deerfoot Trail extension will add to the already poor physical connection with the river in all the communities but Queensland Downs. As the Trail will pass through the valley regional awareness of the riverside area will be enhanced.

A2.8.3 Public Access to the River

There is vehicular access into the floodplain by road near the Canfarge property but not to the river. Vehicles occasionally descend the escarpment to reach the riverbank on Canfarge property and in the Side Hill area. The proposed Deerfoot Trail limited access freeway will not initially permit direct new vehicular access to the riverside.

As the Cominco and Canfarge properties are private, pedestrian access is limited and fragmented. There are presently no upstream or downstream pedestrian linkages but a riverbank bicycle pathway is planned to connect the Queensland Downs escarpment and Fish Creek Provincial Park. Some trails presently exist in the Queensland Downs and Side Hill areas though the latter area is particularly isolated and construction of the Deerfoot Trail will sever existing trails. Presently the escarpment and Blackfoot Trail constitute barriers to riverside use in the Glenmore - Queensland area. The proposed freeway will exacerbate the problem.

There are three bridges in this reach. None allow pedestrian access and only the Graves Bridge (Glenmore Trail) allows public vehicular access. The other bridges are private single-lane structures owned by Cominco and Canfarge. Riverbank pedestrian access will be possible under the proposed Deerfoot Trail crossing.

A2.8.4 Condition of the Riverbank Area

The approximately 80 ha (200 acre) privately owned Cominco Natural Area extends downstream of Glenmore Trail between the Cominco plant and the river. As admittance is only allowed with Cominco's approval the area has seen little human activity for many years. Numerous plant and wildlife species are found in the area which has developed a forest cover of Balsam Poplar and Aspen with a thick understorey of willows and various shrubs. Two large islands, thickly covered with natural forest, also show little sign of human disturbance.

The Side Hill will be seriously affected by the Deerfoot Trail extension. About 48 ha (120 acres) will remain between the freeway and the river. The Deerfoot Trail will cross the river in the southern portion of the Canfarge site. Immediately south of this will be an intersection with the Bowbottom Trails. The Transportation Department plans to remove 400,000 in yards of land from this area for use as fill.

Natural vegetation buffers much of the Canfarge site from the riverbank. No screening exists on its other boundaries.

The escarpment adjacent Queensland Downs is a unique natural area covered with White Spruce Forest. Presently the Queensland community is set back about 150 m (500 ft.) from the top of the escarpment but there are plans to extend development to about 18 m (60 ft.) from the escarpment (approximately 80 m or 260 ft. from the river). The City Planning Department proposed Burnsmead Design Brief Amendment (March 1979) recommends that a 2 ha (5 acre) open space area be providd in the northermost portion of the site to buffer the residential area from the proposed Bowbottow/Deerfoot Trails interchange; that measures be taken to ensure preservation of existing vegetation on the escarpment; that trails into the area should be constructed and that fencing be installed on roadways to prevent vehicular access to the area.

A2.9 SILVER SPRINGS AND VARSITY ACRES

A2.9.1 General Description of the Communities

The two communities are composed predominantly of single family dwellings. Both communities were developed during a period of rapid growth in the early 1970's. The 1977 population of Silver Springs was 6,760 and of Varsity Acres, 11,632.

The river forms the official southern boundary of Silver Springs and the unofficial southwestern boundary of Varsity Acres. Both communities are physically separated from the river by a high, steep escarpment which runs along, and close to the left bank of the river throughout the reach. Two large areas of river flats occupy portions of the base of the escarpment. Both lie in the floodplain, which follows the base of the escarpment, and are partially in private ownership. In the western flat is the approximately five hectare (13 acre) Fournier residential property with an access road leading to 85th Street N.W. Al Klippert Ltd., a sand and gravel processing plant, owns a portion of the eastern flat, an approximately 28 hectare (70 acre) parcel of land below Varsity Acres. A major feature of the area is the private Silver Springs Golf and Country Club which consists of a series of tenuously connected 'fingers' of green space extending within and along the frontage of Varsity Estates and separating this community from Silver Springs.

The escarpment and river flats area is variously known as 'Silver Springs', and 'Montgomery Flats'. The riverside open space throughout the whole area is now called 'Bowmont Park' but apart from a trail it is not developed as a formal park, consisting of pieces of community reserve land, utility corridors, private land and the CPR right-of-way.

A2.9.2 Relationship to the River

Crescent-shaped streets and cul-de-sacs, bordered by single family dwellings, extend along the edge of the escarpment in both communities. There is no continuous street along the edge of the escarpment so there is little traffic on these peripheral streets and as there is no development on the south side of the streets there is an unimpaired view of the river valley. The vista encompasses the whole of Bowness and the river upstream, as far as the Bearspaw Dam.

The average height of the escarpment is about 45 m (150 ft.) and the residential edge of the communities varies from 180 to 540 m (600 to 1,800 ft.) from the riverbank. A number of steep narrow gullies dissect the escarpment affecting the pattern of residential development.

Because the size, shape and configuration of those parts of the communities adjacent to the river is affected by local relief configurations related to the river valley and because of the elevation of development and excellent views over the whole river valley, both communities enjoy an intimate and unimpaired relationship with the river.

A2.9.3 Public Access to the River

There is no public vehicular access to the river flats or riverbank. Private roads connect the Fournier property to 85th Street N.W. and the Klippert operation to 32nd Avenue N.W.

Pedestrian access to the riverbank is generally good. In the most westernly portion of the reach it is adversely affected by some marshy ground, a City snow dumping site, two tree nurserys, the CPR tracks and the private Fournier property. A pedestrian trail follows the line of the escarpment up to 245 m (800 ft.) away from the river. At the easternmost end of the reach, access is restricted by a short row of houses extending upstream from the Shouldice Bridge for about 2 1/2 blocks. The

City is in the process of acquiring some of the land for public housing (and would allow riverbank access), and negotiations are continuing for the rest. However, because the riverbank open space terminates where it abuts the northernmost residential property, the formal trail leads onto 52nd Street N.W., four blocks north of Bowness Road.

One hazardous area is the escarpment adjacent to Silver Springs. It is exceedingly steep and slopes directly into the river which is deep, very fast flowing and actively eroding the base of the escarpment. This area is utilised as an informal adventure playground by the children of Silver Springs.

Elsewhere, pedestrian access is continuous. A formal trail runs along the top of the escarpment in front of the Silver Springs community gradually descending to the easternmost river flat in front of Varsity Acres where Klippert have permitted a riverside easement fenced off from the rest of their property.

Pedestrian access across the river exists at the extremities of the reach, via the 85th Street Bridge and Shouldice Bridge. There is no riverbank access beneath Shouldice Bridge.

A2.9.4 Condition of the Riverbank Area

The riverine escarpment is covered with grasses and low shrub. In the area by Silver Springs the hold of much of the vegetation is tenuous due to the steepness and instability of the slope. At the top of the slope there is some manicured parkland adjacent to the communities. The Crematorium Hill area of the escarpment between approximately the Varna Crescent and 19th Avenue N.W. alignments has been stabilized in accordance with recommendations made in the Montreal Engineering Report (1973). The area has subsequently been landscaped.

Of the three major ravines dissecting the escarpment only the central one, known as Waterfall Valley, is well vegetated and provides a good wildlife habitat. The other two have been drastically altered by excavation for major sewers serving the communities to the north. These ravines have subsequently been replanted.

In the river flats the areas of major disturbance are the vacant and unsightly snow site and the Klippert concrete development which consists of numerous buildings, roads, stripped land and a large water-filled pit. In both areas, the actual riverbank remains largely in a natural state. Three storm sewer outfalls mar the riverbank near the 85th Street Bridge.

Despite extensive human modification and probably due partly to limited vehicular access, significant areas of land, notably in the river flats and along the steeper parts of the escarpment, remain in a natural state. Apart from Balsam Poplar and Aspen there are areas of juniper and White Spruce and a large number of plant and animal species have been identified.

A2.10 MONTGOMERY

A2.10.1 General Description of the Community

Montgomery is an established, family-oriented community with a high proportion of children. The 1977 population was 3,924. The Bow River borders the western and southern portions of the community.

Montgomery is effectively divided into two areas by MacKay Road. To the west is the old, predominantly single-family residential community where over 90% of the buildings were constructed before 1960. There is some commercial development along the two main roads - the Trans-Canada Highway and Bowness Road - and recently some duplexes have been built in the western portion of this area. To the east is largely undeveloped Provincially-owned land and the new Point McKay townhouse development which is situated on approximately 18 hectares (45 acres) of land between 3rd Avenue N.W. and the riverbank and separated from the rest of Montgomery by expressways. This area includes the historic McKay House.

Situated on the inside of a river meander in the western part of Montgomery is the Shouldice Athletic Park which is bisected by the Trans-Canada Highway. Almost half of the riverbank adjacent to the Park is taken up by country residential lots and the 'Bow Bend Trailer Court'. Only the area north of the Trans-Canada is developed as a park and oriented towards the river.

About 10 trailers in the trailer court lie in the floodway. About 70 residential buildings, the 'Bow View Nursing Home' and a few other institutional and commercial buildings are inside the floodplain limit. The Point McKay development has complied with existing Flood Plain Management Policy Guidelines.

A2.10.2 Relationship to the River

The main residential area of Montgomery is located within a large rectangular grid, only one side of which abuts the river. Apart from the Point McKay Development and a small triangular area sandwiched between Home Road and the Trans-Canada, the community has no designated orientation towards the river. Nevertheless, because the river acts as a natural boundary and because only about 25% of the riverbank in this reach is in private ownership, the community does have a reasonable relationship with the river and many parts of the community have actual visual contact.

A2.10.3 Public Access to the River

There is vehicular access to the riverbank via the Point McKay Road and Montgomery Boulevard, both of which parallel the river for short stretches. Pedestrian access exists via a red shale pathway which extends along public portions of the riverbank and receives considerable use. The Point McKay developers dedicated the adjacent riverbank land as public reserve and there are numerous points of access to the riverbank in Shouldice Park.

A number of factors restrict pedestrian riverbank access in Montgomery. A large number of community residents have to cross both the Bowness Road and the Trans-Canada Highway to gain access to the river. Once in Shouldice Park, the Trans-Canada impedes access from one section of the Park to the other. Due primarily to residential development, access along the riverbank is not continuous. Montgomery has the only breaks in the 'Chinook Trail' pathway system, which otherwise extends unbroken along the left bank between Silver Springs and Bridgeland. Finally, the steeper sections of the riverbank (particularly in the south side of Shouldice Park and in the Boothman Pedestrian Bridge area) impede pedestrian riverbank access.

A2.10.4 Condition of the Riverbank Area

The Montgomery riverbank is largely unlandscaped and it's potential is neglected. Downstream of Boothman Bridge the strip of public land, although recently replanted with grass and trees, has a rather bleak appearance. Upstream of the bridge the appearance of the riverbank is only marginally better. In the southern part of Shouldice Park the riverbank is mostly bare and uninteresting though the portion between the Trans-Canada and Shouldice Bridges is attractive and closely related to the park area.

Throughout the reach the riverbank varies from gentle vegetation covered slopes to steep, unstable, bare embankments. There are three islands, all low lying and only partially vegetated.

A2.11 PARKDALE

A2.11.1 General Description of the Community

Parkdale is primarily a residential community with some commercial activity on 3rd Avenue N.W. near Parkdale Boulevard - most of the residential houses are about 30 years old. The land use classification is mostly R-2 and there has been little redevelopment. The community's population declined 10% between 1973 and 1977 and was 2,023 in the latter year.

The riverine escarpment and the Bow River form the north and south boundaries of the community. To the west, the Point McKay residential development is physically oriented towards Parkdale rather than Montgomery. The Bowness Road thoroughfare crosses this area. West of 32nd Street N.W. it is called 3rd Avenue N.W. and to the east, Parkdale Boulevard. Parkdale Boulevard extends along the entire river frontage of the community. It has major road status east of 32nd Street N.W. and 'local' status to the west.

There is no private property immediately adjacent to the river and no property is affected by the floodway. About 32 houses and an apartment building lie in the floodplain.

A2.11.2 Relationship to the River

A strip of public open space extends between the riverbank and Parkdale Boulevard. On the opposite side the Boulevard is flanked by an almost continuous row of older houses. Parkdale therefore 'faces' the river, which is a distinct component of the community. District awareness of the river is good due to the continuity of the riverside open space on both sides of the community and visual access is possible from vehicles travelling along Parkdale Boulevard.

A2.11.3 Public Access to the River

The main expressway is a major barrier to pedestrian access to the riverbank. West of 32nd Street N.W. Parkdale Boulevard does not impede pedestrian crossing or leisurely sight-seeing driving.

The red shale 'Chinook Trail' pathway passes through this community on the public open space by the river, facilitating access to the area by residents of adjacent communities. The high, steep riverbank inhibits pedestrian access to the river itself.

A2.11.4 Condition of the Riverbank

The riverside open space has only recently been planted with grass and trees. Near 32nd Street N.W. there is little vegetation at all. The general appearance of this land is barren and unattractive.

The steep and high riverbank is largely covered with natural brush and trees. There is a low gravel bar in the river opposite 32nd Street N.W.

A2.12 WEST HILLHURST

A2.12.1 General Description of the Community

West Hillhurst is an older community developed in the post Second World War days. There has been some redevelopment but the population declined 10% between 1973 and 1977 and was 5,240 in the latter year.

The community is bound by the escarpment to the north and river to the south. Two major thoroughfares pass through the area, the Crowchild Trail and Parkdale Boulevard, which becomes Memorial Drive east of the Kensington Road junction. The Crowchild/Memorial interchange dominates the riverside area between the 20th and 25th Street N.W. alignments.

There is no private property immediately adjacent to the river and no property is affected by the floodway. About 100 houses, 4 institutional buildings and the approximately 1.5 hectare (4 acre) community sports field are located in the floodplain.

A2.12.2 Relationship to the River

A strip of public open space extends between Parkdale Boulevard and Memorial Drive and the river. In the western section an uninterrupted row of houses front onto the Parkdale Boulevard and the river is clearly visible from the community. In the eastern section Memorial Drive has been constructed at a higher grade than the houses facing it. Additionally there is a dyke between the road and the riverbank so community residents have no visual access to the river. Consequently community awareness of the river is weaker downstream of the Kensington Road than upstream.

Awareness of the river by people outside the community is good due to the continuity of public riverbank open space on both sides of the community and the good views of the river available from the three major roads.

A2.12.3 Public Access to the River

As in the Parkdale community, Parkdale Boulevard is a substantial obstacle to pedestrian access to the riverbank. In the Memorial/Crowchild area the situation is aggravated to the extent that pedestrian access to the riverbank is effectively rendered impossible along half the community's frontage. Memorial Drive is wider than Parkdale Boulevard. In the interchange area the divided roadway and chain link fence block public access. There is no pedestrian access across the Crowchild Bridge, the closest pedestrian bridging points being 2.5 km (1.5 mile) upstream and 1.5 km (1 mile) downstream.

The Chinook Trail pathway provides continuous access along the riverbank passing under the Crowchild Trail but because of problems of access, is used primarily by recreationalists from outside the community. Access to the river itself is difficult due to the steepness of the riverbank except in the open space east of Crowchild Trail which is vacant and exceedingly unattractive.

A2.12.4 Condition of the Riverbank Area

Upstream of Crowchild Bridge the high, steep, riverbank is covered with natural brush and trees. Downstream, the riverbank is generally low with less vegetation.

The Memorial Drive alignment and Crowchild/Memorial interchange have severely affected the riverside open space in West Hillhurst. The access road from Memorial Drive to the southbound Crowchild lanes passes within 7.5 m (25 ft.) of the river. About 3.2 ha (8 acres) of land is isolated between traffic lanes and a further area of similar size left vacant by the river. The absence of any landscaping or maintenance is unfortunate.

There are three small islands, including the partially excavated 'Archer's Island' located upstream of the Crowchild Bridge. They are covered with trees and low shrub.

A2.13 HILLHURST-SUNNYSIDE

A2.13.1 Description of the Community

Hillhurst-Sunnyside is the oldest community north of the Bow River. Approximately 45% of the holdings are of pre-1914 construction and 97% of the buildings date from prior to 1961 (Established Communities in Calgary, 1974). Whilst the housing stock is deteriorating, the Residential Rehabilitation Assistance Program has resulted in some renovation. This is a family-oriented residential neighbourhood with a high proportion of elderly residents and is undergoing some change with the construction of low rise apartment buildings which is bringing in young couples and single people. The 1977 population was 7,980.

The community is bound by the riverine escarpment to the north and east and the river to the south. Three major roads cross the area. 10th and 14th Streets N.W. cut north-south through the community and are lined with commercial activities, and Memorial Drive runs parallel to the river along the southern edge of the community.

There are no private properties located immediately adjacent to the river and no properties located in the floodway. The floodplain affects the community more seriously than any other in Calgary. About 1,200 houses and apartment buildings and 30 commercial holdings are located in the floodplain limit, which at the Louise Bridge alignment extends a distance of about 910 m (3,000 ft.) from the river.

A2.13.2 Relationship to the River

Hillhurst-Sunnyside has a very strong orientation towards the river. A continuous row of houses interspersed with some old apartment buildings faces onto Memorial Drive and the riverbank park. The riverside dyke conceals the actual river from view but is landscaped and rows of mature poplars line both sides of Memorial Drive. This is one of the most visually attractive riverside drives in the City but the usually heavy traffic volumes on Memorial Drive unfortunately do not permit leisurely driving. Due to good views and a central location this stretch of riverbank is very familiar to Calgarians.

A2.13.3 Access to the River

14th, 10th and Centre Streets cross the river in Hillhurst-Sunnyside and are important commuting routes. Pedestrian access across the river exists on all three and also via the Prince's Island Bridge.

Due to Memorial Drive's width and heavy traffic load, pedestrian access to the riverfront is impaired. Safe pedestrian crossings exist only by the three road bridges, each of which interrupts the riverbank Memorial Drive Park. The Chinook Trail pathway extends along the dyke throughout this reach and pedestrian access exists under Mewata Bridge.

Access to the river can be gained down the riverbank which is covered with thick vegetation. Trails connect river flats located between 10th and 14th Streets N.W.

A2.13.4 Condition of the Riverbank Area

The riverbank itself is covered with natural vegetation, primarily tall shrubs and Balsam Poplar. A dyke runs for about 3 km (2 miles) along the top of the riverbank. It was constructed following the 1932 flood. Memorial Drive Park is sandwiched between Memorial Drive and the dyke, which separates it from the river. Only west of 10th Street N.W. is it wide enough to allow recreational use and some separation from the traffic. Nevertheless this is one of the most attractive and best known areas of the river. It is a manicured park with caragana bushes and mature, 40 year old Balsam Poplars.

The river flats are attractive and covered with brush and trees. Offshore and downstream of the flats are a number of small islands - basically gravel bars with sparse vegetative cover.

A2.14 CRESCENT HEIGHTS

A2.14.1 General Description of the Community

Crescent Heights is an older established community with a slowly declining population which was 5,341 in 1977. In 1974 64% of the buildings dated from between 1914 and 1945.

The riverine escarpment separates the built-up area from the community which is entirely outside the floodway and floodplain limits.

A2.14.2 Relationship to the River

The community's official boundaries extend to the river for only a short stretch but extend some 912 m (3,000 ft.) to the west along the top of the escarpment. Crescent Road parallels the escarpment in this area and is bordered by houses on its northern side, permitting excellent views of the whole river valley. Curiously, to the east of the Centre Street Bridge where the community boundaries do extend to the river, there is no continuous route along the edge of the escarpment. The orientation of the streets combined with heavy vegetative growth, inhibit visual contact with the river. An exception occurs by 2nd Street N.E. where the new Holly Park apartment development is oriented towards the river.

Good views of the river are to be had from Memorial Drive and the Centre Street and Langevin Bridges though heavy traffic volumes do not permit leisurely driving.

A2.14.3 Public Access to the River

Both Memorial Drive and the steep riverine escarpment parallel the river and restrict pedestrian access to the riverbank. Centre Street cuts through the escarpment and divides the community but does facilitate pedestrian access down to the riverside area.

The Chinook Trail passes through this area. Both the old Langevin and Centre Street Bridges have to be crossed at grade. The latter in particular constitutes a serious pedestrian hazard due to the lack of provision for pedestrian access underneath the bridge by the junction between Memorial Drive and the Centre Street underpass. Pedestrian access across the river exists via the Centre Street and old Langevin Bridges.

A2.14.4 Condition of the Riverbank Area

The riverbank is mostly quite high and steep and covered with natural brush and poplar, some of which are very large The potential for a natural riverine environment has been lost in this area due to disruption caused by transportation arteries and residential developments.

Three areas of open space remain. The strip of parkland between Memorial Drive and the riverbank is covered with manicured grass and large poplars. It is interrupted for about 120 m (400 ft.) by a City snow dump which is completely barren and gravel covered when not in use. The parkland strip between Memorial Drive and the escarpment is also manicured and planted. However, it is exceedingly narrow and physically isolated except for a pathway leading down from Centre Stree. Finally, the remaining undeveloped portions of the escarpment have heavy vegetative growth and no formal trails.

A2.15 BRIDGELAND-RIVERSIDE

A2.15.1 General Description of the Community

Bridgeland-Riverside is one of Calgary's older communities - about 40% of the buildings were constructed before 1914. The population has been slowly declining and was 5,598 in 1977.

All boundaries are delineated by natural features - the riverine escarpment to the north and west, the river to the south and Nose Creek to the east.

A strip of aging commercial buildings line Edmonton Trail which is backed by a sizeable residential area primarily composed of single family dwellings. This area is divided by the eastern corridor of Edmonton Trail which was constructed in 1972. West of 6th Street there are a few modern apartment buildings. The central part of this area is dominated by the General Hospital, community open space and an area of mixed uses north of Memorial Drive which has nursing homes and other institutional buildings, a high rise apartment block and a light industrial area. To the east of 12th Street St. George's Heights Park is divided into paddocks for large zoo animals.

To the south of this area are the large St. Patrick's and St. George's islands. The former is a landscaped park and the latter is the site of the Calgary Zoo.

The floodway affects the whole of St. Patrick's Island, the sides and downstream part of St. George's Island and that wooded portion of the zoo situated on a promonitory downstream of St. George's Island. The floodplain includes the whole of St. George's Island and passes immediately in front of the General Hospital affecting about 120 residential structures, 40 units of housing for the elderly and various institutional and commercial buildings, including part of the Canadian Institute for the Blind's office building.

A2.15.2 Relationship to the River

In the past Bridgeland-Riverside had no strong orientation to the river. Recent widening of Memorial Drive has removed many commercial and light industrial uses which formerly blocked visual access to the riverside area. The riverside park and two islands are now visible but an old flood-control dyke which borders the river along most of the community's frontage effectively screens the river from view.

A2.15.3 Public Access to the River

Memorial Drive constitutes a major barrier to pedestrian access to the river and the volume of traffic prevents leisurely sight-seeing driving. Pedestrian crossings exist at the traffic lights at 12th Street N.E. Baines Bridge and Edmonton Trail. There is vehicular access to Centenary Park on St. Patrick's Island via Baines Bridge and also along the south side of the zoo and across the river to 12th Street S.E. via the south St. George's Island Bridge. Provision for pedestrian is provided for on both bridges.

The Chinook Trail system continues along the left bank of the Bow River throughout this community's reach of the river. There is pedestrian access underneath the new Langevin Bridge and to St. George's Island via the pedestrian zoo bridge near the 12th Street N.E. alignment. A recently constructed pedestrian suspension bridge links the northern part of St. Patrick's Island to Fort Calgary Park.

A2.15.4 Condition of the Riverbank Area

Whilst the riverside reach of this area suffers from the common left bank problem of being too narrow and adversely affected by the proximity of Memorial Drive, it is nevertheless most attractive being covered with manicured grass and containing many large poplars.

The riverbank is fairly high and steep and largely covered with natural shrubs and trees - especially willows and Balsam Poplar.

The banks of both St. Patrick's and St. George's islands are bordered by an dense growth of trees which present a pleasant appearance from both banks of the Bow River.

A2.16 INGLEWOOD GOLF COURSE AND THE IRRIGATION CANAL AREA

(Including the Crossroads, Albert Park-Radisson Heights, Southview and Dover Communities)

A2.16.1 General Description of the Area

Four communities are located at the top of the riverine escarpment along this area's rech of the river but none have boundaries extending to the riverbank. The communities are separated from the river by natural and man-made features.

The escarpment averages about 30 m (100 ft.) in height and for the most part has a very steep slope. The W.I.D. irrigation cannal, whose headworks are located opposite Pearce Estate, flows along the base of the Escarpment. The extensive private Inglewood Golf Course is situated on City-owned land between the canal and the riverbank. Deerfoot Trail which has an approximately 90 m (300 ft.) right-of-way, presently extends between the canal and the Bow River as far south as 17th Avenue S.E. and is under construction southwards through the golf course to a river crossing at the 50th Avenue S.E. alignment.

The riverflats are largely in open space uses. The golf course occupies about one-third of the length of the length of this reach's riverbank. Most of the river flats at the southern end of this reach were the site of an oil refinery owned by Imperial Oil Ltd. The land has been purchased by the City and cleared for the Deerfoot Trail extension.

The only structures in the floodplain are the Inglewood Motel and Trailer Court, the golf course clubhouse and the remains of the demolished refinery.

A2.16.2 Relationship to the River

The Crosslands community is located between the Deerfoot and Barlow Trails in the uplands north of memorial Drive. The southern portion of this community is in industrial use and the residential areas are over 1,200 m (4,000 ft.) from the river.

The residential part of the Albert Park-Radisson Heights is composed of old single family houses and is located close to the top of the escarpment. The area has a good relationship with the river. A minor street parallels the escarpment edge and there is access down the escarpment to the Max Bell Memorial Arena and the canal.

Southview is a newer residential community situated at the top of the escarpment with an unobscured view of the river valley. It is separated from the escarpment edge by Barlow Trail.

The rapidly growing residential community of Dover is separated from the escarpment by the Barlow Trail. Much of Dover is set back from the escarpment edge and surrounded by land slated for development.

Neither the neighbouring communities nor the City as a whole presently have a planned relationship with this reach of the river and no strong relationship has developed naturally.

A2.16.3 Public Access to the River

Vehicular access to the riverbank exists in the section of the Zoo upstream of the weir and where Odgen Road crosses the river. The latter has no river-oriented facilities. An informal roadway traverses the riverbank between the Zoo and 17th Avenue S.E. A new road is planned to give access to the Inglewood Golf Course.

The Deerfoot Trail extension will provide continuous riverside visual access throughout this reach but there will be no exists between 17th and 43rd Avenues S.E. The extension will further isolate the communities of Southland and Dover from the riverside because Deerfoot is a restricted access freeway and only major planned crossings will be provided. This is the most northerly reach of the Bow River which will be affected this way. The widening of Barlow Trail will have a similar and reinforcing effect to that of the Deerfoot Trail.

Formal pedestrian access exists between the Zoo and Cushing Bridge at 17th Avenue S.E. South of this point the private golf course is one of Calgary's largest stretches of riverbank with no public access. Riverbank trails indicte that informal use is made of the area. A wide equestrian trail on the dyke by the irrigation canal provides a pedestrian by-pass around the golf course. The canal is the chief public recreational resource along this reach. It forms the headworks to Chestermere Lake and together with it's right-of-way, is called the 'William Pearce Water Conservation Area'. The Department of the Environment in consultation with City Park-Recreation Department plans to develop the area as recreational link between the Bow River and the Max Bell Memorial Arena. The Deerfoot Trail extension crosses the canal at the golf course, disrupting an area of about 450 m (1,500 ft.) Pedestrian access will be provided under the bridge.

Four bridges cross this reach of the river. Only Cushing Bridge does not interrupt pedestrian riverbank access. Because of the lack of continuity of riverbank access, this area marks the effective termination of the Chinook Trail which extends upstream to Montgomery.

A2.16.4 Condition of the Riverbank Area

The riverbank varies in height and slope along this reach of the river. The steeper sections are unstable and bare, paticularly at the Bonnybrook Bridges. The Ogden Road bridges and accompanying railway tracks disrupt the riverbank and adjacent low lying land. Nevertheless most of this reach has a natural riverside growth of Balsam Poplar and various shrubs.

The riverbank of the golf course remains in a largely natural condition and the canal is bordered by mature Balsam Poplars. North of 17th Avenue S.E., indiscriminate vehicular use had disturbed the riverside area but the recent removal of the trailer court has created opportunities for improvement.

A low island at the south end of the golf course is owned by the Province and covered with tall shrubs. A similar area exists by the old refinery site. Both areas are natural refuges for plant and animal life.

A2.17 MILLICAN-OGDEN

A2.17.1 General Description of the Community

Situated between the Ogden CRP shops and the river, this community is predominantly residential. Houses to the east are up to 65 years old whilst that part of the community located adjacent to the riverine escarpment is new and some of it is still under development. The community has grown rapidly in the 1970's. In 1977 the population was 8,616 and the projected population is 11,000 to 12,000 (Ogden Design Brief, Calgary Planning Department; Revised 1977).

The escarpment is buffered from the housing by a continuous strip of public open space, a feature which will be retained in proposed development north of 60th Avenue S.E. In the floodplain at the foot of the escarpment at the northern end of the community is the City-owned 'Beaverdam Park' a 21 ha (53 acre) semi-natural area with some family recreation facilities. In the south, the official community boundary is the 96th Avenue S.E. alignment but for the purposes of this report the Glenmore Trail (Graves) bridge is used.

A2.17.2 Relationship to the River

The residential community faces the river and has extensive views of the river valley from the top of the escarpment. Industrial development on the opposite side of the river detracts somewhat from the view. Local streets border the escarpment allowing leisurely sightseeing driving. The housing does not impose visually on the river valley, being visible from below the escarpment only in a few places. Because of the peripheral location of this community there is little outside awareness of this reach of the river.

A2.17.3 Public Access to the River

There is no vehicular access down the escarpment to the river. A parking area located at the top of the escarpment serves Beaverdam Park. From here a gravel roadway leds down the escarpment to the park. Parking is possible on the minor streets bordering the escarpment and on a car park situated at the top of the escarpment adjacent to Lysander Drive north of Lynnover Way.

An open space system connects the community's interior with the escarpment. Trails lead down the escarpment and along the riverside from the Millican CNR Bridge to the Graves Bridge - neither of which permit pedestrian access across the river. There are presently no formal trails upstream or downstream of the bridges.

A2.17.4 Condition of the Riverbank Area

Beaverdam Park is located on the inside of a river meander. The riverbank is very low and covered with tall shrubs and willow. The Park is mostly covered with natural riverine forest, interspersed with grassed areas. The low degree of development may help to maintain the Park in a natural state. In 1975 the Calgary Field naturalists Society identified many plant and wildlife species in the area.

Abutting the Park on the north is a similarly vegetated 4.5 ha (11 acre) area of valley bottom land which is adjacent to the old Imperial Oil refinery site and is to be dedicated as public reserve.

The riverine escarpment extends along the entire reach of the river and is adjacent to the river downstream of Beaverdam Park. Averaging about 23 m (75 ft.) in height, the slope varies from very steep to moderate. The vegetation cover is low shrub and native grass. Pedestrian trails have caused some disturbance.

A2.18 BURNCO-CANFARGE AREA

A2.18.1 General Description of the Area

Apart from a few houses located by Glenmore Trail over a mile from the river there are no residences in this reach of the river. The area is dominated by industrial operations. The sand and gravel extraction operations of Burnco, Consolidated Concrete and Canfarge extend from the riverbank to 24th Street S.E. - a distance of about 1.6 km (1 mile). The operations have excavated below the flood plain limit and large areas are often water filled. There are only two public streets within the reach. The proposed Deerfoot Trail extension will cross the river about 500 m (1650 ft.) south of the private Canfarge Bridge.

A2.18.2 Relationship to the River

The entire left bank is owned and occupied by industries with the exception of the City-owned Carburn Park and a small parcel of adjacent land to the southwest which is owned by the Province of Alberta. A small sports field on Consolidated Concrete property and a wooded river flat on Canfarge property are utilized as recreational areas by the companies.

Carburn Park is too isolated to receive much public use and the area is generally unknown.

A2.18.3 Public Access to the River

15th Street S.E., which is used primarily by industrial traffic, gives access to Carburn Park and a short stretch of riverbank. The park has no facilities and access is obscure.

'Buoy Busters', a private model boat racing club, makes use of a Provincially owned artificial lagoon, using a private Burnco road for access.

Riverbank pedestrian access is presently only formally possible within Carburn Park. There are no pedestrian linkages upstream, downstream or across the river.

A2.18.4 Condition of the Riverbank Area

A short length of riverine escarpment located adjacent to the 'Buoy Busters' lagoon screens the gravel pits from the area. It is steep, about 20 m (65 ft.) high, and covered with natural vegetation - primarily Balsam Poplar and tall shrub.

The industries have ignored their riverside areas. There is no screening and the generally steep riverbank is covered intermittently with trees and tall shrubs.

Carburn Park and the semi-natural area on Canfarge land are partly river flats with low riverbanks and are thickly covered with Balsam Poplars and tall shrubs. The clear central area of Carburn Park is covered with non-native grasses. An inaccessible island by the Park is well-treed and used by deer for shelter.

A2.19 C.I.L. - DAON AREA

A2.19.1 General Description of the Area

This reach is divided into two major areas. The northern portion is owned by Canadian Industries Ltd. (C.I.L.) together with two sections of adjacent property. The southern portion is owned by the Daon Development Corporation. Presently on the riverside area opposite the new Deer Run development is the 18 ha (45 acre) Patterson property which includes a farm house, outbuildings and a coulee.

The C.I.L. plant covers nearly 40 ha (100 acres) of land over 1 km (.6 mile) from the river. Most of the rest of the area is presently farmland.

A2.19.2 Relationship to the River

The C.I.L. plant is not visible from the riverbank. There is a picnic shelter located close to the riverbank which is used by C.I.L. employees for family outings and linked to the plant by a major roadway. There are views upstream and downstream from the Highway 901 (Highway 22) bridge which marks the city limits.

A2.19.3 Public Access to the River

The only vehicular access along the top of the escarpment is via 146th Avenue S.E., a gravel roadway relatively isolated from the city.

Due to private ownership there is presently no access along the riverbank and there is no provision for pedestrian access across the 901 Highway Bridge. Because of the lack of access and isolated location of this area this is the least known reach of the Bow River. This situation is rapidly changing. Firstly, the right bank Fish Creek Provincial Park (which is the largest of it's kind in North America) has good views across the river, so public awareness of this reach of the river is growing. Secondly, the proposed Deerfoot Trail extension will bisect this area passing 600 to 1,500 m (2,000 to 5,000 ft.) to the east of the river, providing Calgarians with a fast access link to this part of the city. Finally, a consulting company, Clark, Swanby & Company Ltd., has been retained by the City to prepare a residential area structure plan for the Daon and Patterson areas. The area has a projected population of about 20,000 residents.

A2.19.4 Condition of the Riverbank Area

It is possible to identify three distinct stretches of riverside along this reach of the Bow River - an upper portion, a middle portion and a lower portion.

The upper portion extends downstream to the approximately 125th Avenue S.E. alignment. All this land is C.I.L. property. The escarpment is set back a long way from the riverbank, to the east of the C.I.L. plant and is covered with short grass. The riverbank is low and bordered by intermittent tracts of woodland, dominated by Balsam Poplars. Areas of shrub and non-native grass surround the treed areas.

The middle portion extends from the approximately 125th Avenue S.E. alignment where the escarpment rejoins the river, to the Patterson property. Here the steep, high escarpment is immediately adjacent to the river and covered with native grasses, tall shrubs, and groves of trees. Immediately south of the 146th Avenue S.E. alignment it is quite heavily wooded.

There are isolated natural areas at the base of the escarpment on C.I.L. property. They contain a mixture of tall shrubs, Balsam Poplar and Aspen woods. An approximately 6.5 ha (16 acre) provincially owned island is part of the Fish Creek Provincial Park and provides an undisturbed sanctuary for wildlife and waterfowl. The C.I.L. has a licensed industrial discharge outlet in a creek which joins the river at the northernmost part of this stretch.

The southern portion extends to the City limits. It is dominated by the inside of a meander which is naturally vegetated with trees and tall shrubs. Behind the meander are a series of slumps leading up to the escarpment which is stepped in two portions and situated away from the river. Throughout this stretch the riverbank is generally low and portions are either bare or covered only with grass. At the southern end of the reach is a naturally vegetated river flat with native, nonnative grasses, tall shrub and some Aspen poplars. The floodway affects much of the inside of the meander and the river flat.

A3 ENVIRONMENTAL INVENTORY

The following section is devoted to a discussion of the environmental conditions existing in and adjacent to the Bow River within the City of Calgary.

A3.1 EXISTING VEGETATION AND NATURAL HABITAT

The major types of 'green areas' adjacent to the Bow River are discussed under four headings: established parks; natural and semi natural areas; disturbed areas and farmland.

A3.1.1 Established Parks

These are parks which receive intensive use as part of the city-wide parks system. They are maintained by the Parks and Recreation Department. For the most part the larger trees have been left, the understory has been cleared and hardy grasses and some exotics have been planted. Areas of varying size in many of the parks have been intensively manicured whilst others have been left in a natural or semi-natural state.

Presently there are 12 established parks by the Bow River, namely: Bowness Park, Bowmont Park, Shouldice Park, Edworthy Park, Prince's Island Park, Centenary Park, Fort Calgary, the Calgary Zoo, the William Pearce Estate, the Inglewood Bird Sanctuary, Beaverdam Park and Carburn Park.

Bowmont and Carburn Parks are not formally developed as Parks. The former possesses a trail and some minor landscaping whilst the latter is in a natural state. Fort Calgary is discussed under the Elbow River Environmental Inventory. Both the Zoo and the Inglewood Bird Sanctuary are specialised parks. The Pearce Estate is partly specialised as its major focus is the Livingston Fish Hatchery. The remaining six are major developed parks receiving considerable use.

Fish Creek Provincial Park marks this study's downstream boundary on the right bank of the Bow River. It is a major regional recreational facility which extends along the Bow River to the city limits and across much of the southern portion of the city. It is the largest park of its type in North America.

There are privately used golf courses at Silver Springs - adjacent to Bowmont Park and at Inglewood - opposite the Bird Sanctuary. The Shaganappi Golf Course, west of the Crowchild Trail, and the Maple Ridge Golf Course which is situated about 450 m (1,500 ft.) from the Bow River and separated from it by the Blackfoot Trail are public facilities.

A3.1.2 Natural and Semi-natural areas

Lands adjacent to the Bow River include a wide variety of natural and semi-natural areas ranging from large natural areas to tiny semi-natural remnants. These areas have been categorized and are discussed under 5 major headings - riverine flatlands, islands, escarpments, parks and other areas.

A3.1.2.1 Riverine Flatlands

For the purposes of this study these are defined as areas of low lying land immediately adjacent to the watercourse with low or very gently sloping riverbanks. Distributed fairly regularly along the river, these areas are at least partially within the floodway and entirely within the floodplain. They are shown on the Environmental Inventory Map.

The riverine flatlands are characterized by marshy river flats, moist alluvial soils and areas of riverine forest on the higher portions. In the sluggish water margins are numerous tiny shrimp, water mites, larvae and snails, which are preyed upon by various water insects. In the summer these areas support dense growths of Duckweed and algae. Typical of the vegetation by the water margins are the Beaked Sedge, Common Cattail, Marsh Reed Grass and Small-fruited Bulrush. Such areas provide valuable nesting sites for a variety of waterfowl and other birds. The most common mammal is the Great Plains Muskrat, though these areas are popular with Canada Beaver and on rare occasions Hudson's Bay Mink have been observed. The moist alluvial soils are the home of the Common and Variegated Horsetail, Wire Rush and Alkali Crowfoot. Peach leaf willow and Water Birch are common close to the river backed by Balsam Poplar.

A3.1.2.2 Islands

The islands on the Bow River are a key component in the fragmented system of natural areas existing within the city. With the exception of the developed major islands they are the only areas of the riverine environment that are consistently natural. Climax communities exist on all the islands which are of great visual aesthetic importance regardless of size. For ease of discussion, 4 groups of islands are identified:

a. Major Islands: there are four major islands on the Bow River - Bowness Park, Prince's Island, St. Patrick's Island and St. George's Island. All are developed as major parks though portions of each remain in a semi-natural state.

b. Large Islands: there are five islands on the Bow River ranging in size from 2.8 ha (7 acres) to over 8 ha (20 acres). Two of these islands are in the northwest area of the city and three are in the southeast. With the exception of the island crossed by the twin CPR bridges east of 85th Street N.W. all are in a near natural state. Formerly there was a sixth large island, Archer's Island which now has been dismembered for fill used in the construction of the Crowchild-Memorial interchange.

These islands are predominantly covered with typical riverine forest consisting of a primary growth of Balsam Poplar with an assorted understory of Dogwood, Wolf Willow and various other species of willow. A variety of birds and mammals are found on these islands ranging from various species of ducks and geese to deer and coyote. These islands are important nesting sites, particulary for Canada Geese. Most of the larger species found on these islands are not permanent but temporary residents seeking forage or refuge. In this case the maintenance of wildlife diversity on the islands is contingent upon the retention of similar natural areas on the adjacent mainland.

c. Intermediate-sized Islands: there are numerous islands ranging upwards in size from 1 ha (2.5 acres). The larger areas support a good growth of riverine forest but for the most part they are covered with low and tall shrubs such as Buckbrush and Sandbar Willow with an understory of native grasses. Dependant upon their location relative to the rivershore and the speed of the river current, mammals occasionally visit these islands but they are primarily important as waterfowl nesting sites for such species as the Common Merganser, Mallards and Ring-Billed Gulls.

d. Small Islands: most of these are low gravel bars rising just above the water level. They are frequently inundated by minor seasonal flows and usually possess little growth other than low shrubs and grasses. They are very popular with the gulls.

A3.1.2.3 Escarpments

The major escarpments identified on the Environmental Inventory Map are discussed individually in the succeeding sections. The riverine escarpments are mostly steep and support a wide variety of vegetative, insect, mammal and bird life. The commonly occurring trees are Balsam Poplar, Aspen poplar, Common Juniper, Creeping Juniper, White Spruce and Douglas Fir. Dependant upon the primary growth, the undergrowth is predominantly a mixture of grasses and low and tall shrubs. Three areas of escarpment adjacent to Silver Springs, Millican/Ogden and Acadia/Maple Ridge are covered primarily with numerous species of shrubs and native and non-native grasses.

The escarpments are the dominant visual feature of the riverine landscape and a prime visual aesthetic asset.

A3.1.2.4 Parks

Portions of some major parks have been left in a natural or semi-natural state. These areas are shown on the Environmental Inventory Map and are described under Developed Public Recreational Facilities below. These areas occur on the eastern and western extremities of Bowness Park, the isthmus adjacent to the Nose Creek confluence on recently acquired Zoo land and the northern part of the Pearce Estate. The Inglewood Bird Sanctuary, Bowmont Flats Park, Beaverdam Park and Carburn Park are largely natural.

A3.1.2.5 Other Areas

There are numerous small fragmented and discontinuous areas which are surrounded by the urban fabric and do not fall under the above categories. They can be found adjacent to industrial, commercial, residential and agricultural land uses. With the exception of agricultural uses, adjacent land uses are dissimilar and not complimentary. These areas are of two types - linear strips and small enclaves.

a. Linear Strips: characterized by a riverine forest variously dominated by aspen and balsam poplar, willow and spruce which can be constricted to a single line of trees. The undergrowth consists of various shrubs and grasses. In a few areas tall shrubs are the dominant growth. These strips are of two types - continuous and discontinuous. The former occurs in areas adjacent to transportation corridors or extensive areas of commercial or industrial uses that do not extend to the riverbank. The latter is common in disturbed areas and areas of private residences where the natural growth is retained at the bottom of some rear yards and cleared in others.

b. Enclaves: exhibit a great variety. In addition to the commonly found stands of Balsam Poplar and Aspen there are some small areas of grassland on the higher banks inhabited by the fescue prairie community and various flowering plants. There are areas of thickets with Wild Snowberry and Common Wild Rose. Wolf Willow is common in gravelly areas. Usually secluded and often isolated from access by private property, many of these areas are important nesting and wildlife sites for a variety of ducks and birds and animals such as the Long-tailed Weasel, Canada Beaver and Richardsons Ground Squirrel.

All of the above areas are shown on the Environmental Inventory Map.

A3.1.3 Disturbed Areas

Large areas of land in the Bow River Valley are disturbed. These sites are of a variety of types and sizes and are fairly regularly distributed along the river although the major sites are in the southeast portion of the city. The common characteristic of disturbed sites is a sparsity or absence of vegetation.

Presently a large number of sites adjacent to the Bow River are extremely disturbed due to redevelopment and road construction operations. These sites are not shown on the Environmental Inventory Maps as they eventually become part of the established developed urban fabric.

Other major sites are recorded on the Environmental Inventory Map as follows:

A3.1.3.1 D1: Sites Disturbed due to Recreational Use

Presently this is a problem of varying severity in the Bow River Valley. Dirt trail erosion is locally a problem in some City Parks and on some areas of escarpment. Gullying and significant damage to vegetation and trails is caused primarily by 4 wheel drive trucks and dirt bikes. The two major areas for these uses are the left bank of the Bow River extending out of the City limits to Bearspaw Dam and the escarpment on the left bank of the W.I.D. Canal extending from the Memorial Drive/Deerfoot Trail interchange to the Max Bell Arena.

A3.1.3.2 D2: Sites Disturbed due to Industrial Extraction and Processing Operations

In terms of area affected this is by far the largest category. Examples are: the Klippert Concrete, Supercrete, Burnco. Consolidated Concrete, Canfarge and C.I.L. operations.

A3.1.3.3 D3: Sites Disturbed due to Snow Dumping

There are 4 sites close to the river. These are located 60 M (200 ft.) north of the left bank east of 85th Street N.W. to the east of the Pumphouse Theatre and immediately adjacent to the river east of the Mewata Bridge and between the Centre Street and Langevin Bridges at the 2nd Street N.E. alignment. The 85th Street N.W. site has not been utilized for some time and is partially revegetated.

A3.1.4 Farmland

In the northwest there is a farm on the left bank of the Bow River on Al Azhar Temple land just outside the City limits.

There are considerable acres of farmland to the east of the left bank of the Bow River in the extreme southwest portion of the city. The only farm within the city adjacent to the river is the 18 ha (45 acre) Patterson property opposite the new Deer Run development where there is a small herd of cattle. Large areas of C.I.L. and Daon Development Corporation land behind the riverine escarpment are in arable use.

Areas in farmland use are identified on the Environmental Inventory Map.

A3.2 MAJOR ENVIRONMENTAL RESOURCE FEATURES OF THE BOW RIVER

A salient characteristic of the Bow River valley environment is the common presence of a number of bird and mammal species, habitat types and distinctive physical features. The primary causes are twofold:

Firstly, the geographical location of the city on the high Canadian plains which have a specialized climatic regime that exerts a controlling influence on the occurrence and nature of indigenous flora and fauna. A good example is the Balsam Poplar which is distributed widely throughout the river valley. It is very much a Calgary tree - it is found in a relatively localized region and is distinct from it's related cousins, the Black Cottonwood of B.C. and the Prairie Balsam of southeastern Alberta and Saskatchewan.

Secondly, the past and present fluvial geomorphological processes associated with the river itself. For example, the riverine escarpments are, with the exception of the Downtown skyline, the dominant visual features of the city. In the riverside area itself, riverine processes have created a number of lagoons formed by former river channels in low lying meanders. Some have been artificially modified but they are special features that re-occur in many of the City's recreational areas and they exhibit certain common characteristics. Examples are the lagoons at Bowness Park, Lowery Gardens, Prince's Island, the Inglewood Bird Sanctuary and Beaverdam Flats Park.

Given the existence of certain common major characteristics within the river valley, individual areas of green space exhibit great diversity in terms of flora and fauna, character, topography, aspect and degree of development and use. Due to thisvariability it is inaccurate to make generalisations about the various areas. For example, Bowness Park is a major family recreational facility which receives intensive use and is maintained as a manicured park. Nevertheless, it contains some very natural areas. Conversely, the private Cominco Natural Area is generally considered to be one of the outstanding natural areas remaining in the city, yet it contains a number of seriously disturbed sites. Therefore, for the organizational purposes of this inventory, a threefold distinction is made on the basis of ownership - City-owned, Provincially-owned and privately-owned areas are discussed seperately. With respect to City-owned areas, an additional two fold distinction is made between developed and underdeveloped/partially developed areas.

Table A shows the occurence of various species of vegetation and wildlife in some natural areas which are discussed below. The table is included for the express purpose of indicating the diversity of species occurring in some natural areas within the city and is not an indication of the relative 'value' of the areas included, as only numbers of species and not frequencies of occurrence are recorded - a nesting flock of Canada Geese or a single starling both rate one observation.

TABLE A

THE OCCURRENCE OF VARIOUS SPECIES OF VEGETATION AND WILDLIFE IN SOME NATURAL AREAS BY THE BOW RIVER

AREAS No. Of SPECIES	BOWMONT PARK (MONTGOMERY) FLATS	EDWORTHY/ DOUGLAS FIR/ LOWERY GARDENS	PEARCE ESTATE	INGLEWOOD BIRD SANCTUARY	BEAVERDAM PARK	COMINCO NATURAL AREA	CARBURN PARK
Non-Flowering Plants	36	88	16	29	26	12	13
Mushrooms and their Allies	13	63	31	2	37	20	23
Flowering Plants	214	289	135	221	157	237	23
Butterflys	35	29	8	16	7	8	+
Birds	101	106	70	207	99	90	77
Fish	15	15	15	15	15	15	2
Amphibians and Reptiles	2	2	0	1	1	3	+
Mammals	18	14	7	12	8	11	7

NOTES:

+ No Information Available

- All figures are tabulated from Calgary Field Naturalists Society Reports. The information for Carburn Park comes from "Natural Areas 1973." The information for the areas comes from "Calgary's Natural Areas - A Popular Guide."

- Due to time, labour and other constraints, the Naturalist's Society consider most of the above figures to be conservative estimates of the actual number of species occurring.

- Some of the above areas have been affected by development since the above reports were published.

Individual areas were selected on the basis of two criteria - their recreational significance in terms of existing and potential use and their environmental significance in terms of existing natural and semi-natural areas and diversity of flora and fauna. There was no requirement that the two criteria be co-existing in any one area. Ancillary considerations were size; locational characteristics (with respect to access and existing population distribution within the city) and site characteristics (such as the presence of trails and facilities or interesting geological or fluvial features).

The following sub-sections identify and discuss all the major recreational, natural and semi-natural areas by the Bow River within the city.

A3.2.1 Developed Public Recreational Facilities

A3.2.1.1 Bowness Park

The Park covers an area of approximately 35 ha (86 acres) and was donated to the City in 1911 by the then owner John Hextall. It is an extremely attractive park and one of the most popular family recreational facilities in the city. The park occupies a large island and much of the recreational activity is water-oriented with fishing, picnicking and walking by the Bow River. In the summer rowboats and canoes are hired out for use in the lagoon and west channel and in the winter the lagoon is maintained daily as an ice rink and receives intensive use. Park facilities and activities are fully described in the land use analysis.

The major central portion of the park is manicured with extensive clearings of lawn grass where Richardson's Ground Squirrels are very numerous, surrounded by clumps of mixed Balsam Poplar and Spruce. Water Birch, River Alder and Red Osier Dogwood line the riverbank. A tarmac pathway leads past the lagoon almost to the 85th Street N.W. Bridge. A red shale pathway parallels the north channel to the western edge of the park. Commonly observed birds are Magpies, Woodpeckers and the White Throated Sparrow. Canada Geese, Common Mergansers and Common Goldeyes can be seen on the river.

The western portion of the park supports a good stand of White Spruce and the underbrush is only partially cleared. The Northern Oriole nests in this vicinity. A dirt trail leads through the area. Canada Beaver and the Great Plains Muskrat have been frequently observed in the north channel of the lagoon.

East of 85th Street the park is in a largely natural state. This is an area of riverine forest containing mature balsam poplar with an understory of tall and short shrubs such as Red Osier Dogwood, various willows and Water Birch by the river. There are a number of small clearings and a dirt trail. The Richardson's Ground Squirrel, Deer Mouse, Red Backed Vole and Meadow Vole have been observed here. The area is intermittently used as a day camp centre and there is a small wooden shelter used for this purpose. Numerous Sparrows, Warblers, Chickadees and Woodpeckers visit the area. Areas such as this are important nesting sites as the inside of old Balsam Poplars rot, providing valuable nesting sites. In manicured parks these trees are removed and the bird species who utilize them also leave.

Immediately east of the 85th Street N.W. causeway is a small disturbed area which park maintenance utilize for storage and dumping. This site, and some of the surrounding clearings present a neglected appearance.

A3.2.1.2 Shouldice Athletic Park

This is an area of approximately 43 ha (107 acres) which was donated to the City for use as a park in 1910 by the then owner James Shouldice.

The two sections of the park are maintained separately. The smaller portion situated between the Bowness Road and Trans-Canada Highway is manicured and covered largely with lawn grass. The riverbank area supports mixed Balsam and Aspen Poplar with an understory of shrubs and native and non-native grasses. Facilities include a fire pit, several barbeque stands, washrooms and parking lots. There is a Little League baseball diamond and an outdoor swimming pool.

The major portion of the Park south of the Trans-Canada has little tree growth, is seeded with non-native grasses and is given over to Athletic use. This area has 4 fastball diamonds, one slow pitch diamond, one Little League diamond, one Big League diamond, a Class B Soccer field, two class D Soccer fields, a maintenance shed, car parking facilities and an indoor ice arena. The Parks/Recreation Department have made a recommendation that this Park be extended to include the existing country residential area and trailer court located to the southwest of the park.

A3.2.1.3 Edworthy Park

Approximately 78 ha (191 acres) in size, this park was purchased by the City in 1962 to retain an option on an extension of the Shaganappi Trail. With City approval, most of this area is presently maintained as a park.

Edworthy is the largest of the City's riverside parks and receives considerable use. The area has 3 car parks, washrooms, picnic tables and shelters, numerous fire pits and some barbeque stands, power points on some poles, two night lights, 3 tot lots, a rink which is flooded for ice skating in winter and a large open playing field. The eastern portion of the park is extensively used as a day camp area in the summer. The park also contains the old Edworthy House which is a historic site and two tree nurseries in the northwestern part of the floodplain where numerous species are cultivated prior to replanting in various city parks.

Edworthy Park is of particular significance as part of a broad strip of 'green space', predominantly natural, which extends from the privately-owned property at approximately the 52nd Street N.W. alignment to the Crowchild Bridge and has public access eastwards from Edworthy Park.

The Park is topographically divided into four separate components containing distinctive vegetation and wildlife habitats which are outlined as follows:

1. The Floodplain Area - consists of the inside of a broad meander in the northernmost portion of the park. It is bisected by the CPR tracks which are bordered by Caragana Hedgerows. Lawn grass covers much of the floodplain and the picnic area to the north of the CPR tracks is surrounded by rows of Blue

Spruce. A strip of natural riverine forest borders the river. The dominant tree is Balsam Poplar with some White Spruce and an undergrowth of Red Osier Dogwood with a few Water Birch and willows on the riverbank. Birds frequenting the area include House Sparrows, Chipping and Clay Coloured Sparrows, Swainsons Thrush, Bohemian Waxwing and Evening Grosbeak. The clay riverbanks provide nesting sites for Bank Swallows where Ringbilled and California Gulls roost on the offshore islands and gravel bars. Common Goldeye, Common Merganser and Mallard are found on the river.

2. The north-facing escarpment - supports mixed Aspen woods with a few stands of Balsam Poplar and some open grassland areas. There are several springs in this area and an abandoned sandstone quarry. The shrubby undergrowth exhibits great variety and includes Canada Buffalo Berry, Saskatoonberry and Chokecherry. Frequently observed mammals are the American Varying Hare, White-footed Mouse and Meadow Vole.

3. The ravine - bisects the escarpment providing access to the park via a gravel road which leads to the Spruce Drive entrance. Wolf Willow grows at the top end of the ravine with mixed poplars and a few White Spruce at the lower end and on the west facing slope. The area has numerous seepage springs, some areas of prairie grassland on the east-facing slopes and patches of Juniper and Common Bearberry on dry exposed slopes.

4. The Plateau - at the top of the escarpment adjacent to the Sarcee Trail to the west of the ravine is covered with prairie grassland with some Aspen Groves and Brome grass. Flowering plants include Three-flowered Avens, Cut-leaved Anemone, Prairie Crocus, Pussytoes and Western Wood Lily. The Western Meadowlark is occasionally observed in this area.

A3.2.1.4 Shaganappi Golf Course

This is one of the best known Golf Courses in the city. It is a public facility occupying approximately 63 ha (156 acres) of City-owned land south of the Bow River adjacent to the Crowchild Trail. The riverine escarpment which continues into this area is discussed in the Douglas Fir Trail Section.

The area has three golf courses which are intensively utilised by cross-country skiiers in the winter. A short downhill slope bisects the escarpment. Facilities include a ski tow, ski hut, refreshment facilities, washrooms and car parks.

A3.2.1.5 Prince's Island Park

Prince's Island Park occupies approximately 16 ha (39 acres) and became a park in 1968. The Western 75% of the Park is formally developed as a manicured park whilst the remaining area is owned by the Province and is largely bare being covered with rocks, numerous weeds and clover. The immediate riverside portion of this latter area supports some Balsam Poplar, willow and Wolf Willow. This portion of the Park is to be seeded.

The major portion of the park is crossed by a number of trails and a red shale pathway with adjacent deals for exercises. It is divided fairly evenly between seeded lawn and riverine forest - the understorey of which has been mostly cleared apart from the riverbank where there are some willow.

Facilities include picnic tables, a tot lot, a bandstand and numerous ornamental structures - notably a cupola. There is a concession building by the lagoon which contains washrooms and there are paddle boats for hire on the lagoon.

A3.2.1.6 Centenary Park

Situated on St. Patrick's Island, the dominant vegetation is mixed poplar riverine forest with an understorey of shrubs and native and non-native grasses. The undergrowth has been cleared in some areas and there are some open seeded areas. The park is lit, has several trails, a tot lot, picnic tables, barbeque stands, a car park and washrooms.

A3.2.1.7 The Zoo

Officially named the Calgary Zoological Gardens and Natural Historic Park the main zoo area is located on St. George's Island. The zoo also owns a considerable area of land on the mainland bounded by the Bow River, Nose Creek on the south and east and the 12th Street N.W. and Centre Avenue and its eastward alignment to Nose Creek on west and north. Some of this area is presently used for parking and animal paddocks. The zoo is planning major expansions which will include new prehistoric Dinosaur Park.

The zoo acquired its first animal in 1918 and is now a major recreational facility. Since the fall of 1975 when winter admission charges were first levied the Zoo has been annually receiving just over 700,000 visitors. Aside from the Zoo exhibits and maintenance buildings, facilities include numerous trails, benches, washrooms, sheltered rest areas, restaurants, minor food service and merchant sales and a gift shop.

Vegetation on the island is extensively modified riverine forest composed primarily of mature Balsam Poplar with a shrubby undergrowth which predominates at the eastern and western extremities of the island and along the riverbank. Seeded lawns occupy the central portion of the island. On the mainland there are extensive areas used as car parks and a small isthmus east of the island covered with largely natural riverine forest. On the hillside north of Memorial Drive the prairie grassland fescue community is grazed by range animals.

A3.2.1.8 The Pearce Estate

This is an attractive formal Park occupying about 14.5 ha (36 acres) on either side of the W.I.D. weir. The original settler who gave the area it's name was a surveyor for the Northwest Territories who settled here in 1884 on 79 ha (196 acres) of land and established Alberta's first experimental farm.

The estate is now maintained as a formal park with an interlacing system of trails with benches, washrooms, picnic tables, and a parking area. The Sam Livingstone Fish Hatchery, completed in 1973, occupies the northwest portion of the park. It is the largest hatchery in Alberta designed to provide yearly up to 8.6 million fish of eight different species to stock the province's rivers and streams. There are facilities to accommodate public visits and tour guides are available during the peak season.

The dominant tree is Balsam Poplar with a cleared understorey. An interconnecting system of open spaces is seeded with lawn grass. There are semi-natural areas of riverine forest in the northern part of the Park on W.I.D. land, and surrounding a dyke which was constructed to contain artificially raised waters caused by the dam. In addition to the riverine forest there are marshy areas, gravel bars, willow thickets and open patches of land. Wolf Willow, Red Osier Dogwood and Snowberry are much in evidence. There is some Beaver activity and muskrats have been observed. Birds sighted in the area include the Song Sparrow, Red-Winged Blackbird, Common Flicker and Western Wood Peewee.

An area of Provincial land in the north western portion of the park contains patches of riverine forest and shrubs - particularly Sandbar Willow. Linked to the park by an earth and gravel bridge, this area annually becomes an island during periods of high water on the river.

A3.2.1.9 Inglewood Bird Sanctuary

Colonel James Walker settled this area in 1882 building a series of houses, the latest of which, a brick structure, stands today and is a historic site. The area became a Federal Migratory Bird Sanctuary in 1929 and was purchased by the City in 1970. Currently, about 24 ha (59 acres) in size it includes facilities such as trails, pedestrian bridges over water channels, a car park, washrooms, picnic tables and natural history displays in Colonel Walker House. The City sponsors natural history courses in the area and a park naturalist is available all year round. Much of the area is in a natural state and it is officially maintained as a sanctuary. Parks and Recreation employees only enter the area to do specific maintenance jobs. There are nesting boxes in many of the trees.

The area is mostly covered with a riverine forest of Balsam Poplar with an understorey of Red Osier Dogwood, Water Birch, Wolf Willow, Saskatoon Berry and several species of willow. There is an area of grassland in the western portion of the Sanctuary. The area supports a great diversity of wildlife with sightings of Canada Beaver, American Varying Hare, White-footed Mouse, and even Hudson Bay Mink but is most notable for its birds which are particularly proliferous prior to migration in the last week of August. Some species observed are the Killdeer, Belter Kingfisher, Song Sparrow, Bohemian Waxwing, Redpoll, Mallard, Great Horned Owl, Bald Eagle, White-breasted Nuthatch, Canada Geese, Ringtails and rarely, Saw-whet Owls and Gyrfalcons.

A prominent feature of the area is the lagoon formed by a former river channel. In late fall the Brown and Brook trout spawn here, and in summer Leopard Frogs, Water Striders and various water plants such as the White-Water Crowfoot and pondweeds are much in evidence. Water quality in the lagoon is monitored on a regular basis by the Province as there have been intermittent complaints of oil seepages from the adjacent Gulf Oil Refinery.

A3.2.1.10 Beaverdam Flats Park

This is a City-owned park of approximately 19 ha (46 acres) which has dirt trails, an old road, fire pits, barbeque stands, washrooms and a tot lot. There is a parking area at the top of the riverine escarpment. The park occupies a point bar on the inside of a river meander which is gradually increasing in size due to the accretion of sant and gravel deposits which have created a number of subparallel bars which are in the process of being colonised. The area has an interesting history of divided ownership due to the fact that it is bisected by a section line. It was purchased by the City in 1973.

Most of the area is covered by Balsam Poplar and mixed poplar riverine forest with an undergrowth of Shrubby Cinquefoil, Common Wild Rose and Wolf Willow. There is a central area of tall grasses. The gravel bars have been colonized by willows with an understorey of Wire Rush, Wild Chives and Viscid Locoweed. There is a mixed grass prairie community at the top of the escarpment and on the west-facing slopes. A lagoon occupies a former river channel and is bordered by a thick underbrush including Water Birch, Willow and Common Cattail. Some bird species observed in the area are the Killdeer, Least Sandpiper, Yellowlegs, Common Flicker, Mourning Dove, Eastern Kingbird, American Kestrel, Canada Goose and Bald Eagle.

A3.2.2 Undeveloped/Partially Developed Public Areas

A3.2.2.1 Bowmont Park

A large area of predominantly green space over 120 ha (200 acres) in size which extends in a wide arc from 85th Street N.W. north of the bridge almost to Shouldice Bridge. Ownership of this area is fragmented including City and Provincial land, private land, an industrial operation, the CPR right-of-way and a developer's option for the extension of the Silver Springs development. The City's Transportation Department has retained an option on a right-of-way through the area for possible future extension of the Sarcee Trail.

Approximately half this area, about 70 ha (172 acres) of City owned land is administered by the Parks/Recreation Department. There is some landscaping in this area but presently the only formal development is a tarmac trail which runs along the top of the escarpment parallel to Silver Springs, descending to riverine flatlands at about the 47th Street N.W. alignment.

The whole area is naturally divided into a number of separate components each of which are composed of various vegetative and wildlife habitats with distinctive characteristics. These are outlined as follows:

1. Riverine flatlands - exist in the western and eastern portions of the area. These are areas of riverine forest with Red Osier Dogwood as the most common shrub. Yellow Pea Vetch, Twining Honeysuckle and American Vetch grow around the shrubby undergrowth. Other flowering plants included the Fringed Loosestrife, Veining Meadow Rue and Baneberry. Some birds commonly seen in the area are the Mourning Dove, Brownheaded Cowbird and American Robin. Both deer and Canada Beaver are frequent visitors whilst Canada Lynx have been observed on the Fournier property. The Klippert gravel pits are popular with Mallard, Canada Geese, Spotted Sandpipers and Killdeer. Eastern Kingbirds and the Northern Oriole nest in the riverside trees and the Common Merganser and Belted Kingfisher can be seen on the river.

2. The south-facing escarpment - is steep, unstable, partially bare and is being actively eroded by the river at its base. It dominates the central portion of the area. Occurring here are the Smooth Blue Beard Tongue and some Double Bladdermorts which are rare in the city. Leaf cutter bees can be observed and Bank Swallows nest in holes in the escarpment face.

3. Grasslands - of the prairie fescue community at the top of the escarpment support Moss Phlox and Pussytoes, Prairie Crocus, Early Cinquefoil, Early Blue Violet and such ground-nesting birds as Clay-Coloured Sparrows and Meadowlarks. The American Varying Hare and American Kestrel are commonly sighted.

4. Ravines - bisect the escarpment containing streams and numerous small springs where quantities of tufa are deposited. Vegetation was stripped from the westernmost ravine, which has been utilized as a utility corridor, and re-establishment is being impaired by recreational use of the area and a residential population of Richardson's Ground Squirrels. The ravines support numerous thickets containing Balsam Poplar, Water Birch, Red Osier Dogwood, Saskatoon Berry and Wild Rose. Flowering plants include the Yellow Prairie Violet, Townsendia, Prairie Crocus, Wild Bergamot, Sticky Purple Geranium and Moss Phlox flower. These areas are popular with the Black-capped Chickadees and Common Redpolls and are notable for the number of butterfly species that can be observed here.

5. The large island - situated off the northern end of the riverine flatland between approximately the 48th and 41st Avenues N.W. alignments is in a near natural state. Some disturbance has resulted from boaters camping in the summer and children crossing the ice to the island in winter. The island is covered with riverine forest dominated by Balsam Poplar with some River Alder and White Spruce and is a nesting site for the red-tailed Hawk and Canada Goose. Canada Beaver, deer, herons and coyotes visit this area.

A3.2.2.2 The Douglas Fir Escarpment

The escarpment is bisected by a number of ravines containing streams and averages about 60 m (200 ft) in height extending eastwards from Edworthy Park below the communities of Wildwood and Spruce Cliff through the lower slopes of the Shaganappi Golf Course to the Crowchild Trail - a distance of about 4 km (2 1/2 miles) which covers an area of approximately 33 ha (81 acres). In 1972 Student Armed Forces Programs constructed a trail through the area as far as the bottom of the Shaganappi Trail which is known as the Douglas Fir Trail.

The eastern part of the escarpment supports mixed poplar woods with Balsam Poplar dominant on the lower slopes and Aspen on the higher drier areas. There are some mature White Spruce.

The dominant tree in the western two thirds of the escarpment is the Douglas Fir and there are some magnificent specimens up to 400 years old. Balsam Poplar and White Spruce also grow here. There is an understory of Red Osier Dogwood, native and non-native grasses and flowering plants such as Canada Violet, Star-flowered

Solomon's seal, Wild Red Raspberries, Common Yarrow and Sticky Purple Geranium with Prairie Crocus on open slopes. Coyotes have been observed in the area and numerous bird species including the Northern Oriole, American Robin, Black Capped Chickadees, Redtailed and Swainson's Hawks, American Kestrels, Red-breasted Nuthatch, Evening Grosbeak and Hairy and Downy Woodpeckers.

A3.2.2.3 The riverine escarpment located west of Centre Street adjacent to the communities of Crescent Heights, Rosedale and Sunnyside

The sinuous escarpment extends into grounds of S.A.I.T. but its continuity and immediate relationship to the river are broken at approximately the 7th Street N.W. alignment, at which point the base of the escarpment is about 455m (1,500 ft.) from the river's edge. At about the 2nd Street N.W. alignment the base of the escarpment is within 90 m (300 ft.) of the watercourse. The land at the foot of the escarpment contains part of the community of Sunnyside, a curling rink, car park, landscaped area, disturbed area and Memorial Drive.

The escarpment is about 38m (125 ft.) high and is covered with mixed native and non native grasses, some low and tall shrubs, and a number of isolated groves of Balsam Poplars - notably to the south and east of the 1st Street N.W. alignment. There are a number of flowering plants which are particularly noticeable in the spring and summer. The area contains no outstanding habitats and is primarily of aesthetic significance. Viewed from the south of the river it is a prominant area of green space. From Crescent Road, which parallels the top of the escarpment, there are excellent views over the river, Prince's Island and the Downtown area. The steepness of the escarpment inhibits recreational use. A couple of trails lead diagonally down the escarpment from Crescent Road to 7th Avenue N.W. and there are a number of tobaggan runs in the area during the winter.

A3.2.2.4 An area of flatlands on the right bank of the Bow River immediately south of the Bonnybrook Bridges

This is an area of riverine flatlands and forest approximately 6 ha (15 acres) in size beyond which is an area of grassland of approximately 9 1/2 ha (24 acres) which extends to 46th Avenue S.E. The land is City-owned and there is informal public access. The grassland supports native and non-native grasses including Speargrasses and Awnless Brome. Some flowering plants observed in this area are the Prairie Crocus, Strawberry, Golden Bean, Cut-leaved Anemone and Small Everlasting. The Killdeer frequents this area.

The riverine flatlands can be divided into two basic types of habitat. Immediately adjacent to the river is an area of shrubs including Water Birch and various willows of which the Sandbar Willow is the most common. In the central very low lying portions of the flatlands this habitat extends up to 45 m (150 ft) from the watercourse. Red-Winged Blackbirds and Spotted Sandpipers frequent this area. At the southern end of the area is a small inlet in which various pondweeds grow.

The remainder of the land is covered with a riverine forest of Balsam Poplar with an undergrowth of Red Osier Dogwood and Saskatoon berry. Wolf Willow is found in some small clearings. Some nesting birds include the Eastern Kingbird, Northern Oriole, American Kestrel and Robin. Numerous migrants visit the area.

A3.2.2.5 The riverine escarpment adjacent to the Ogden-Millican area

This west-facing escarpment is the southward extension of the Beaverdam Flats Park slopes and extends to the Graves Bridge. A number of dirt trails lead down the escarpment to the riverside dirt trail. Averaging about 25 m (75 ft.) in height, the escarpment is covered with prairie fescue grassland and patches of low shrub. By the river there are isolated clumps of trees, predominantly Aspen which are most notable at the Lysander Drive alignment. North of the Graves Bridge there is a small disturbed area and a naturally bare area immediately adjacent to the river which is colonized by low shrubs.

This area receives predominantly local use and its recreational value is reduced by the bleak appearance of the Burnco operation on the opposite riverbank.

A3.2.2.6 Carburn Park

The park occupies the inside of a river meander and has an area of about 28 ha (70 acres). It was purchased from Burnco by the City in 1977. Access is via 15th Street S.E. and there are no facilities.

There are some disturbed areas within the park. The northern portion of the park was cleared by Burnco and has little vegetation apart from weedy plants such as Goats Beard and Blue Bur. A cut line passing through the escarpment adjacent to this area has been partially used as a dump and has been colonized by Wolf Willow and Star-flowered Solomon's Seal. There is a larger outline caused by the installation of a gas pipeline which passes through the centre of the meander.

Geomorphologically the area is accreting in size in a manner similar to Beaverdam Flats Park though the process is complicated by the presence of a large natural offshore island which divides the river into two channels.

Much of the area is in a natural state. The floodplain area and island are covered with a riverine forest of Balsam Poplar with an understorey of Water Birch and Willow and some open areas of grassland. To the east are open grassland areas popular with the Richardson's Ground Squirrel with mixed grass prairie at the lower elevations and shorter grass prairie at the higher elevations. The park is bounded by the riverine escarpment which is covered with aspen woods. At the southern end of the floodplain is a small inlet containing pondweeds which is the remnant of a former river channel.

There is a considerable diversity of wildlife in this area. The Great Plains Muskrat, Canada Beaver and Mule Deer have been observed on the island and birds sighted include the Killdeer, Mallard, Blue-winged Teal, Redtailed Hawk, Ring-necked Pheasant, Common Tern and Bohemian Waxwing.

A3.2.2.7 Side Hill Escarpment and Riverside Area

This is a large area of over 155 ha (360 acres) located east of the Blackfoot Trail between the Cominco and Canfarge sites. It was purchased by the City from P. Burns Ranches in 1977. The Deerfoot Trail will pass through this area paralleling the foot of the escarpment for the most part but passing closer to the river in the northern parts of the area and crossing the escarpment in the south adjacent to the Canfarge property. There are a number of trails descending the escarpment and leading across the floodplain to the riverside area.

In terms of vegetation and habitat the area can be divided into four sections as follows:

1. The Escarpment - is covered with native and non-native grasses, low and tall shrubs with some scattered Aspen and a few Balsam Poplars near the base. The main shrubs are Saskatoon Berry, Red Osier Dogwood and numerous species of willow - notably Peach Leaf Willow. The major grasses are Awnless Brome, Goatsbeard, Alfalfa, Yellow and White Sweet Clover and Common Yarrow.

   The escarpment is bisected by the present Canfarge access road and some areas adjacent to the Blackfoot Trailer Park have been disturbed by vehicular activity.

2. The Old Railway Embankment - since the removal of the railway track this area has been extensively colonized by Western Snowberry. It is lined by some good stands of Balsam Poplar (unfortunately exhibiting the signs of industrial melanism characteristic of many of these trees in the city) interspersed with Water Birch and Peach-leaf Willow. This area provides a good habitat for Ring-necked Pheasants, Gray Partridges and California Porcupines.

3. An Extensive Area of Grassland - extends from the escarpment to the riverside area. Many of the grasses found on the escarpment occur here but Alfalfa is predominant. This area is under cultivation. There is some Missouri Goldenrod. Richardson's Ground Squirrels are plentiful and there are a number of American Badger sets. Much of this area is within the floodplain.

   There are some marshy areas and some small sloughs located close to the base of the escarpment. There are two large sloughs. The biggest is about 550 m (1,800 ft.) long and up to 30 m (100 ft.) wide, extending in an arc to just north of the Canfarge property. There is one notable stand of Balsam Poplars adjacent to this slough. Common Cattails, Reed Grass and Perennial Sow Thistles grow adjacent to and in the margins of the sloughs.

4. The Riverside Area - is effectively co-incident with the floodway. It has a parkland landscape with good stands of Balsam Poplar interspersed with grassland and strips of riverine forest closer to the river. The large island opposite the south end of Carburn Park is included in this area.

This area is most notable for the great number of bird species that feed, nest, and winter here. The waterfowl species are present in great numbers. Birds sighted in this area include Canada Geese, Common Mergansers, Mallards, Common and Barrows Goldeneyes, Common Flicker, Herring and Ringbilled Gulls, Downy Woodpeckers, Black Capped Chickadees, Yellow Warblers, House Wrens, Buffleheads, American Robins, Magpies, Eastern Kingbirds, Northern Orioles, Bald Eagles and Redtailed Hawks.

The riverine forest consists of a dominant growth of Balsam Poplars with an understorey of Red Osier Dogwood, various willows, Water Birch, Peach-leaf Willow and Western Snowberry. Common Burdock grows by the river. The understorey has been partially disturbed on the mainland but is extremely luxuriant on the island which is in a very natural state. There are White-Tailed Deer, Canada Beaver, Hudson Bay Mink and American Badger in this area.

A3.2.2.8 The escarpment adjacent to the Queensland Downs development

The escarpment is located adjacent to the community of Queensland Downs, extending northwards to the Canfarge property and covering an area of just over 28 ha (70 acres). The area receives mostly local use and as well as the escarpment, includes a number of grassy east facing ravines and a grassland area at the top of the slope. These areas are outlined as follows:

1. The Escarpment - has a dominant growth of Balsam Poplar with Aspen predominating near the top of the slope. Two of the steeper areas on the escarpment support White Spruce. There is an undergrowth of Chokecherry and Saskatoonberry with willows and Water Birch near the river. Flowering plants include the Blue Columbine, Western Canada Violet and Starflowered Solomon's Seal.
2. The Grassy Ravines - contain a variety of wildflowers such as Windflower, Strawberry, Early Blue Violet, Yellow Pucoon and Pussytoes.
3. The Top of the Slope - supports a prairie fescue community with such flowering plants as the Prairie Crocus, Tall Buttercup, Fairy Candelabra and Pasture Sage.

In total local naturalists have identified almost 60 species of flowering plants and over 100 bird species in this area. In future there will be residential development in the area at the top of the slope and the Deerfoot Trail, Bow Bottom Trail interchange and river crossing is to be located at the southern end of the Canfarge Property and the northern part of this area. Future land use changes are discussed in the land use analysis.

A3.2.3 Provincially Owned Areas

A3.2.3.1 The Islands

With the exception of the major islands which are developed as parks and Archer's Island, all the islands on the Bow River are owned by the Province. They have been identified as important natural areas and are discussed under 'Existing Vegetation and Natural Habitat'. Additionally, the four large islands are discussed individually under those areas to which they are adjacent. For example, the large island in Bowness is discussed under Bowmont Flats Park.

A3.2.3.2 Lowery Gardens

This is an area of approximately 17 ha (42 acres) of Provincially owned land. The name comes from a homesteader who settled here in the 1880's and since that time the area has been variously used for farming, market gardening, gravel extraction and has also had a flour mill. The southern boundary of the park is the CPR embankment which supports Common Wild Rose and Western Snowberry.

Much of the area is covered with a riverine forest of tall Balsam Poplar with an understory of Red Osier Dogwood and Shrubby Cinquefoil. Canada Buffalo Berry and willows grow by the riverbank. Flowering plants include American Vetch, Golden Bean and Early Blue Violet. Some birds observed in the area are the American Robin, Common Flicker, Eastern Kingbird and warblers. The Spotted Sandpiper and Belted Kingfisher frequent the riverbank area.

The riverine forest is discontinuous being divided by cleared areas and a slough. The cleared areas affect much of the western portion of the Gardens and have been severely disturbed by gravel workings and dumping. Partial restoration has taken place and most of the area is now covered with topsoil and has been replanted. Weeds such as Common Dandelion, Common Peppergrass and Stinkweed are common in the remaining disturbed areas. The Sora Slough is an old watercourse in the western part of the Gardens which is divided by the CPR embankment. It is deeper to the south of the embankment where Sparrows-egg Orchid, Elephant Head and False Asphodel grow. Common Cattail, rushes and Beaked Sedge are more common in the shallower, marshy northern portion. Leopard and Chorus Frogs breed in the slough which is also popular with Sora Rail and Red Winged Blackbirds. Around the slough and at the edges of clearings throughout the Gardens are numerous shrubs - willows, Saskatoon Berry, Chokecherry, Wolf Willow, Western Snowberry and the non-native Caragana.

A3.2.4 Private Areas

A3.2.4.1 The riverine escarpment on the right bank of the Bow River extending west for approximately 1.6 km (1 mile) from approximately the 33 Avenue N.W. Alignment

This area consists of a small area of riverine flatlands adjacent to the north channel of the Bowness Park lagoon at the western edge of the park and a steep, thickly wooded escarpment, approximately 53 m (175 ft.) in height which slopes directly into the river and extends unbroken out of the City limits to the Happy Valley Recreational Area - a distance of just over 1.6 km (one mile). The eastern portion of the escarpment is owned by Woods Christian Homes and the western portion by Happy Valley Recreations Ltd. It is arguably the most outstanding natural area in or on the periphery of the city.

The tree growth on the escarpment is a mixture of Balsam Poplar, White Spruce, Douglas Fir and Aspen Poplar. The Balsam is dominant in the lower portion of the slope. The stands of Douglas Fir are at the very least equal in quality to those found on the Douglas Fir Escarpment. Aspen predominates along the top edge of the escarpment and at the western extremity of the area immediately adjacent to the developed portion of Happy Valley where there are several cut lines and some cleared areas. There is a shrubby undergrowth of Canada Buffalo Berry, Common Bearberry, Saskatoon-berry and some Wild Rose on the higher portions of the escarpment. Red Osier Dogwood, various willows and Water Birch are common closer to the river.

There are numerous flowering plants in the area including Wild Strawberries, Western Canada Violet and Mealy Primrose closer to the river. The area contains two species of orchids not found elsewhere in the City - the Northern Tway-Blade and the Habenarin Obstusata. There are a few spring fed slopes where Grass of Parnasus grows. The Yellow Pea Vine grows around the shrubby undergrowth.

A great variety of birds and mammals have been observed in the area. There are numerous wintering birds including the Mountain, Boreal and Black-capped Chickadees, White and Red-Breasted Nuthatch and Brown Creeper. Both the Red-tailed Hawk and Great Horned Owl nest here. Other birds include the Evening Grosbeak, Pine Grosbeak, Common Flicker and Hairy and Downy Woodpeckers. The Pine Siskin can be observed high in the Coniferous trees. Some rare brids seen here are the Water Ouzel, which frequents the area by the western end of Bowness Park by the inlet to the North Channel of the lagoon, and the Northern Three Toed Woodpecker and Pileated Woodpecker.

Some animals observed on the escarpment and at the top of the slope include the Muskrat, Beaver, Mule Deer, American Varying Hare, White-footed Mouse, Long-Tailed Weasel, Coyote, Porcupine, Deer Mouse, Red Backed Vole, Meadow Vole and, very rarely, Lynx.

There are some poorly developed trails along the escarpment used mainly by animals and a well developed dirt trail which parallels the river at a height of about 9 - 12 m (30 to 40 ft) on the lower part of the slope. The area receives some use from walkers from Bowness Park and Happy Valley and from children from the Woods Christian Home and the Happy Valley summer trailer park at the top of the slope - who have constructed a fire pit, tree house and a few dead wood tipi 'dens'. Signs of Deer poaching have been observed. Fire is a potential hazard. There are signs that fires have been lit next to the boles of some fine trees.

There is an intermediate sized island covered with low and tall shrubs including various willows and water birch and containing numerous voles located adjacent to the western portion of the escarpment and extending westwards to opposite the Happy Valley Recreational Area. There is occasional use of the riverbank by fishermen. The area of riverine flatlands adjacent to the western portion of Bowness Park has an excellent growth of riverine forest and is crossed by a well developed dirt trail which is popular with cross country skiers in the winter.

A3.2.4.2 An area of riverine flatlands on the left bank of the Bow River opposite the western extremity of Bowness Park

This is a small area of riverine flatlands located on Al Azhar Temple land. It is approximately 425m (1,400 ft.) long and up to 150m (500 ft.) wide and contains three distinctive types of habitat which are discussed as follows:

1. A Small Inlet - is located at the eastern edge of the area. It is about 70m (230 ft.) long, just under 30m (100 ft.) wide and is fed by a tiny stream. This backwater is separated from the swiftly flowing river and contains a rich aquatic life. Birds observed in this area include sandpipers, Killdeers, mergansers, Mallards, goldeneyes, Canada Geese, Whistling Swans. The Great Plains Muskrat has been observed in the inlet.

   The Blue and Yellow Clematis grow on the riverland on the north side of the inlet. The latter plant is rarely observed in the City.

2. A Low Gravel Bank Adjacent to the River - is sparsely vegetated and periodically inundated during periods of high water. Various bird species forage for insects amongst the stones and in the shallow river margins. Common Cinereous Shrews inhabit this area. Silverberry grows on the slightly higher areas of the bar.

3. A Balsam Poplar Riverine Forest - with an understorey of willows and Red Ossier Dogwood occupies the major portion of the riverflat beyond the gravel bank. West of the flatlands the riverbank becomes well defined. A broad strip of riverine forest on the top of the riverbank extends upstream overlooking the river.

A3.2.4.3 The area commencing at approximately the 33 Avenue N.W. alignment - bounded on the west, north and east by the west channel of the Bowness Lagoon and on the south by the riverine escarpment

This area is contiguous with the major north-facing escarpment and associated riverine flatlands discussed above. It is the collective back yard of several residential properties west of the Bowness Park entrance that front onto 48th Avenue N.W. and is surrounded by a chain link fence. The riverine escarpment is low here, only a few metres in height - increasing in height towards the west.

This area of riverine flatlands supports a first class example of a fully developed Balsam Poplar riverine forest. There is a very dense undergrowth of shrubs including Red Osier Dogwood, River Alder, Water Birch and numerous species of Willow. It is a prime habitat for nesting birds. Warblers are common and Falcons and Sparrow Hawks have been observed. The Great Plains Muskrat and Canada Beaver are often seen here. The area significantly enhances the aesthetic pleasure of walking, cycling or cross country skiing along the Bowness Park's red shale path.

A3.2.4.4 The Cominco Natural Area

This is the largest of the City's natural areas adjacent to the Bow River - it is about 81 ha (200 acres) in size. The area belongs to Cominco which operates a chemical and fertilizer plant to the west. The plant was originally constructed by the Federal Government in 1940 to produce chemicals for use in explosives. In 1946 it was sold to Cominco and the area has received very little use since.

There are some disturbed sites in this area. White and Yellow Sweet Clovers, Alfalfa and knotweeds are found by the roadside with nettles being abundant close to the canal. Perennial Sow Thistle and Canada Thistle are common by the margins of refuse sites. There are also a number of buildings and railway spur lines in the area.

It is possible to identify 5 major habitat types in this area some of which are the most outstanding examples of their type in the city. They are discussed as follows:

1. The Escarpment - this is located outside the generally accepted boundaries of the Natural Area to the southwest of the Cominco Plant, north of the Blackfoot Trailer Park adjacent to the Blackfoot Trail. It is not included in the acreage figure sited above. It is inhabited by the prairie fescue community and some low shrubs. Parts of this area are disturbed by trail bikes and 4 wheel drive vehicles. Adjacent to the Cominco Plant there are some clusters of taller shrubs.

2. Mixed Grasslands - are found to the east of the railway tracks. The most common species are Wheat Grass, Columbia Needle Grass and Awnless Brome. Flowering plants include the White Camas, Prairie Onion, Fleabanes, Early Blue Violet, Wild Bergamot, Brown-eyed Susan, Wild Blue Flax and Bluebells. Together with the acres of low shrub these areas provide nesting sites for the Western Meadowlark, Gray Partridge and Ring-necked Pheasant.

3. Shrub Communities - are dominated by Western Snowberry, Shrubby Cinquefoil and willow thickets. The latter are common in very moist soils near the sloughs with Beaked Willow predominating. Wolf Willow, Shrubby Cinquefoil and Wild Roses grow in slightly drier areas whilst Pasture Sage, Cinquefoil and June Grass grow in the driest areas. Northern Bedstraw and Cow Parsnip flower in these areas.

4. Woodlands - are extensive with a Balsam Poplar riverine forest and adjacent Aspen woods with an understorey of Wolf Willow and willows. The riverine forest covers much of the area including a large manmade island and supports the greatest diversity of plant and animal life. Red Osier Dogwood is the common shrub with Wild Red Raspberry dominant on the island. There are many decaying trees and logs which support many lichens, fungi and mosses. Nesting birds in this area include Common Flickers, Eastern Kingbirds, Cedar Waxwings, Warblers, Northern Orioles, Red-tailed Hawks, and Amercian Robins. Black billed Magpies and Bald Eagles are commonly sighted. There is a resident herd of White-tailed Deer which spend much time in this area and on the open grassland.

5. Aquatic Habitats - are found in the river, canal, sloughs and their margins. Tall Manna Grass and Reed Canary Grass grow on the banks of the canals near the river. Common Duckweed, Hornmort and Mare's Trail are found in the sloughs with the Common Great Bulrush, Small-fruited Bulrush and Northern Green Orchid in the margins. There is a waterside vegetation of Common Cattail, Beaked Sedge and Water Hemlock. Birds observed in these areas include the Belted Kingfisher, Sandpipers, Killdeer, Red-Winged Blackbirds, Great Blue Heron and Franklin's and Ring-billed Gulls. Nesting ducks include the Mallard, Pintail, Canada Goose and Blue-Winged Teal. Leopard Frogs breed in the sloughs where Great Prairie Muskrat are also resident. Canada Beaver have been observed and other animals such as the American Varying Hare, Richardson's Ground Squirrel and White-footed Mouse which stray through the natural area.

A3.2.4.5 An area of riverine flatlands on the left bank of the Bow River located predominantly to the north of the private Canfarge bridge at approximately the 106 Avenue S.W. alignment

There is no riverbank in this area. The riverside area is colonized by an extensive linear strip of tall, virtually impenetrable Sandbar Willows backed by an area of tall shrubs including various species of willows, Peach-leaf Willows and Water Birch. Further inland is a discontinuous Balsam Poplar riverine forest with an understorey of Red Osier Dogwood, Shrubby Cinquefoil, Western Snowberry and Wild Rose. In some areas the understory has been disturbed and partially cleared. There is a wide dirt track leading into the area and some rudimentary and dilapidated picnic facilities utilized by company employees. Wolf Willow grows at the edges of the clearings and there are magpie nests in many of the trees and taller shrubs. Both the White tailed Prairie Hare and Gray Partridge have been observed here.

A high road embankment cuts through the area, leading to the private Canfarge bridge. South of this embankment the riverine forest continues and is isolated from the mainland by a sizeable inlet.

Numerous bird species can be observed from the riverside. These include the Killdeer, Mallard, Goldeneye, Pintail, American Wigeon, Ring-billed Gull, and Black-capped Chickadee.

A3.2.4.6 An area of riverine flatlands situated on the left bank of the Bow River southwest of the C.I.L. Plant

The northern and southern extremities of this area support strips of Balsam Poplar riverine forest with an understory of short and tall shrubs. In the larger, central area the riverine forest has been extensively modified. There is very little understory and there are numerous sizeable clearings and one extensive open strip of land which has been colonized by various native and non-native grasses. Wide trails lead into this area from the C.I.L. plant to picnic areas used by company employees.

Sandbar Willows, Water Birch and various other willows grow close to the riverside. Numerous species of birds can be observed in the riverside area including Pintails, Common Mergansers, American Wigeons, Canada Geese, Mallards and Goldeneyes.

A3.2.4.7 An extensive area of riverine escarpment including some small areas of riverine flatlands extending from approximately the 130 Avenue S.E. alignment to the 24 Street S.E. alignment

Ownership of this area is divided between the C.I.L., the Daon Development Corporation and the Patterson farm.

The escarpment extends in a wide arc on the outside of a major meander and much of it is extremely unstable. It is hummocky in appearance and there are numerous small slumps and shear lines with some larger rotational slumps in some sections. The vegetation on most of the escarpment consists of isolated stands of Balsam Poplar interspersed with extensive areas of shrubs and grasses - Saskatoon Berry, Wild Rose, Ground Juniper and Wheat Grass are common. There are numerous flowering plants including the White Tufted Prairie Aster, Prairie Sage, Brown Eyed Susan, Smooth Blue Beard Tongue, Wild Blue Flax, Common Yarrow and Wild Bergamot. In the southern portion of the escarpment adjacent to and north of the Patterson property there is a more continuous growth of Balsam Poplar interspersed with an occasional White Spruce and Douglas Fir with an understorey of various willows, Saskatoon Berry, Red Osier Dogwood, Shrubby Cinquefoil, Canada Buffalo Berry and Peach-leaf Willow. These shrubs predominate on the island although the northern and western portions of the island support a mature Balsam Poplar riverine forest. River Alder and Sandbar Willows grow adjacent to the watercourse.

The whole area is in a very natural state and supports a wide variety of wildlife. There are the usual numerous species of waterfowl and other birds characteristic of the Bow River throughout the southeast area of the City - Mallard, Common Mergansers, Canada Geese, Common Goldeneyes, Buffleheads, and Killdeer. Animals observed in this area include Deer, Mink, and Porcupine towards the top of the escarpment.

A3.2.4.8 The inside of a river meander situated on the left bank of the Bow River opposite to the Fish Creek confluence

A Balsam Poplar riverine forest has developed on a series of subparallel point bars which have developed due to the deposition of fine sediments on the inside of this relatively tight meander. Due to grazing the understory is very sparse but there is some Shrubby Cinqufoil. Birds observed in this area include the Canada Goose, Mallard, Common Merganser and Great Blue Heron.

Behind the riverine forest is a well developed Water Birch community interspersed with some White Spruce. Brids found here include the Brown Thrasher, Grey Catbird, Cedar Waxwing, Eastern Kingbird, Yellow Warbler, Least Flycatcher and Western Wood Peewee. Animals include White Footed Mice, Meadow Voles, Short tailed Weasels, Skunks and Coyotes.

The escarpment extends in a wide arc on the outside of a major meander and much of it is extremely unstable. It is hummocky in appearance and there are numerous small slumps and shear lines with some larger rotational slumps in some sections. The vegetation on most of the escarpment consists of isolated stands of Balsam Poplar interspersed with extensive areas of shrubs and grasses - Saskatoon Berry, Wild Rose, Ground Juniper and Wheat Grass are common. There are numerous flowering plants including the White Tufted Prairie Aster, Prairie Sage, Brown Eyed Susan, Smooth Blue Beard Tongue, Wild Blue Flax, Common Yarrow and Wild Bergamot. In the southern portion of the escarpment adjacent to and north of the Patterson property there is a more continuous growth of Balsam Poplar interspersed with an occasional White Spruce and Douglas Fir with an understorey of various willows, Saskatoon Berry and Water Birch.

In the riverine flatlands in the northern and central portions of this area is a well developed Balsam Poplar riverine forest with an understorey of various willows, Saskatoon Berry, Red Osier Dogwood, Shrubby Cinquefoil, Canada Buffalo Berry and Peach-leaf Willow. These shrubs predominate on the island although the northern and western portions of the island support a mature Balsam Poplar riverine forest. River Alder and Sandbar Willows grow adjacent to the watercourse.

This whole area is in a very natural state and supports a wide variety of wildlife. There are the usual numerous species of waterfowl and other birds characteristic of the Bow River throughout the southeast area of the City - Mallard, Common Mergansers, Canada Geese, Common Goldeneyes, Buffleheads, and Killdeer.

Animals observed in this area include deer, Hudson Bay Mink, and California Porcupine towards the top of the escarpment.

A3.2.4.9 An area of riverine flatlands on the left bank of the Bow to the north of Highway 901 (22)

This is an area of Balsam Poplar riverine forest. Extensive grazing has considerably reduced the understory but there is a sporadic distribution of Wild Rose, Western Snowberry, Shrubby Cinquefoil, various willows and Water Birch.

Some birds observed in the riverside area are the Canada Goose, Mallard, Common Merganser, Common Goldeneye, American Wigeon and Whistling Swan.

A3.3 THE RIVER

For the purposes of this report the Bow River is environmentally significant in three respects. Firstly, in the effects of its basic characteristics. Secondly, in terms of the recreational use it receives and thirdly with respect to ongoing physical processes. These are discussed as follows:

A3.3.1 Basic Characteristics

Basic characteristics of the Bow River are its rapid speed of flow, clarity and predominately gravelly channel bed. The speed of flow results in a highly oxygenated environment whilst the clarity is largely due to the precipitation of suspended salts into the upstream dams. These characteristics have important environmental effects on both pollution and the river's aqueous habitats.

A3.3.1.1 Pollution

Considering the size of the city, the Bow River is presently not as seriously polluted in North America which as many other rivers flow through urban areas of comparable size. However pollution of the Bow River is a major problem and water quality is adversely affected by numerous discharges - notably from the two sewage treatment plants, various licensed industrial outlets, storm sewers and upstream polluters. The basic characteristics of the river mitigate the effects of pollution in two ways. Firstly the speed of flow quickly carries waste discharges downstream thereby affecting downstream users more than the city itself. This process is aided by the 'flushing' effect of high snowmelt flows and the fact that most discharges are seasonal or intermittent and that most industrial outlets are located in the southeast portion of the City.

Secondly, the high initial oxygen content of the water safeguards the various forms of aqueous life, all of which have critical minimum oxygen demands, from the deoxygenating effects characteristic of many pollutants, and associated algal growths. Nevertheless, the rich supply of nutrients in the southeast portion of the city does create problems with the growth of weeds, algae and phytoplankton - particularly when hot weather coincides with low flows and the abstraction of water for irrigation purposes.

Water pollution in the Bow River is discussed in detail in a separate section of this report. (D1 see also Vol II B9; B11 and B1.)

A3.3.1.2 Aqueous Habitats

Although the water temperature in the Bow River is always cold, rarely rising above 10° C, the river supports a richly diverse variety of aquatic life. The various physical and biological components of the riverine system interact to support a distinctive aqueous ecosystem. The following listing gives some examples of the manner in which the dominant river characteristics affect aqueous life:

- the various species of trout and Rocky Mountain Whitefish which have high oxygen requirements thrive in the highly aerated waters of the Bow River;
- backwaters and the shallow, stony, high sunlight environment of the river margins support fairy shrimp, water mites, snails and the insect larvae of the mayfly, stonefly, caddisfly, mosquito and blackfly - all of which feed on algal cells and are in turn preyed upon by various water insects, birds and fish;
- the clarity of the river enables the various species of fish to effectively seek their prey. This partially accounts for the vigorous condition of the fish in the river;
- local flow conditions and variations in the topography of the channelbed provide the diversity of environment required by the fish for spawning, feeding, resting and wintering sites.

Presently there is a complimentary and interrelationship between the various components making up the Bow River's ecosystem. Nevertheless the various habitats do not exist in isolation and although the system may be robust and well developed it is maintained by a delicate system of balances that can only tolerate a certain amount of abuse. A basic biological law, Leipzig's Law of the Minimum, states that the occurence and functioning of any organism is limited by that environmental factor least favourable to it's existence.

A3.3.2 Recreational Use

Recreational use of the Bow River takes many forms. The prime recreational characteristic of the river is it's aesthetic importance. The attraction of water is universal and the presence of a major river flowing through a prairie city enriches the quality of life of the population by acting as a visual centrepiece in the midst of the urban fabric.

A miscellaneous number of recreational pastimes are regularly water-enhanced. These include walking, jogging, cycling, cross country skiing and a wide variety of passive and sedentary recreational pastimes such as reading, meditating, picnicking and sunbathing.

However, due to the water's temperature, speed of flow and depth, direct water-based activities are restricted to two pastimes - boating and fishing. These are discussed as follows:

A3.3.2.1 Boating

Primarily takes the form of canoeing as power boats are prohibited and rowing boats are unwieldy with limited manoeuverability on a river of this type. Rubber and plastic dinghies of various shapes and sizes can frequently be observed on the river though the majority are patently unsuited to this type of use.

Within the City there are two major reaches frequently utilized by canoeists - from the Bearspaw Dam to the W.I.D. Weir and from the Graves Bridge to Carseland. Many of the regular canoeists on the river are members of the Calgary Canoe Club which has an active white water group.

A3.3.2.2 Fishing

The Bow River supports large fish populations of a diverse number of fish. The following species have been identified in the river - Longnose Sucker, White Sucker, Northern Mountain Sucker, Rocky Mountain Whitefish, Northern Blue, Burbot, Trout Perch, Cutthroad Trout, Rainbow Trout, Brown Trout, Brook Trout, Longnose Dace, Spottail Shiner, Spoonhead Sculpin, Flathead Minnow and Broad Stickleback. The basic characteristics of the river are instrumental in maintaining vigourous and healthy fish - a process aided by the presence of predatory and cannabilistic species such as the Northern Pike and the larger trout which feed on the weaker and sickly fish thereby maintaining a vigorous process of natural selection.

The main sport fish sought by anglers are the Rocky Mountain Whitefish, Rainbow Trout and Brown Trout. The whitefish are the most prolific whilst the trout are the most prized. Presently the Bow River is considered to be one of the best trout streams on the continent. Maintenance of this distinction is entirely dependant upon the continued preservation of the existing aquatic environment. Recalling Leipzig's Law of the Minimum, the critical components of the aquatic environment requiring preservation may be identified as the basic characteristics of the river outlined above - particularly water flow levels; water quality and suitable resting, feeding, wintering and spawning sites for the various fish species. Of these, spawning sites are presently most susceptible to adverse environmental changes.

There is presently no artificial stocking of the Bow River in the City of Calgary. Occasionally some of the eight species of trout, grayling and salmon reared by the Livingston Fish Hatchery escape through the filters but such fish are characteristically unsuited to compete in the present aqueous environment and have a poor survival rate. Future existence of the present fish populations is therefore dependant upon successful annual spawnings.

The various fish species have individual spawning requirements. Taking the three major sport fish as an example, the Brown Trout and Rocky Mountain Whitefish spawn in the fall and the Rainbow Trout in the spring. The whitefish habitually 'lie-up' in deep ice free holes in the winter moving upstream, preferably into the higher reaches of the river, during the spring and gradually returning, spawning as they go, in the fall. The trout exhibit a similar pattern (although the periods of migration vary according to the time of year in which they spawn) but are rather more exacting in their spawning requirements moving high upstream into the small gravelly mountain streams to deposit their eggs. The presence of manmade structures on the rivers adversely affects spawning migrations.

The W.I.D. weir does not seriously affect fish movements. It has a five stepped fish ladder frequently utilized by White and Long-nosed suckers, Brown Trout, Rocky Mountain Whitefish, Rainbow Trout and even Northern Pike. Both the Glenmore and Bearspaw Dams are absolute barriers to fish movements. Whitefish appear to spawn readily in the river and some Brown and Rainbow Trout spawn in the reaches below the dams but the traditional spawning grounds are unattainable. This leaves the area to the south of the city. Some trout run up Fish Creek but low summer flows impede fish movements. The Highwood River and it's smaller tributaries high up in Kananaskis country are major spawning grounds for trout found in the city. On the lower Bow there is a fish ladder on the Carlsland Dam but this is of very limited effectiveness due to the lack of a good tailwater at the base of the ladder and poor water flows on the ladder. There is no fish ladder on the Bassano Dam so no trout enter the city from the Oldman and South Saskatchewan river systems. On the Highwood River there are irrigation intake channels for water abstraction above High River that frequently reduce flow levels to the point where fish movements are unimpaired.

The situation with respect to spawning habitats of the major sport fishing species in the city is precarious. Future construction of any major irrigation, power or water supply facility on the Highwood River would result in a single major body of water in the Calgary region interconnected by the confluences of the Elbow and Highwood River, and divorced from natural spawning grounds. This would seriously compromise the sport fishing capability in the Calgary section of the lower Bow River.

A3.3.3 Physical Processes

Because fluvial processes are dynamic the immediate riverine environment is in a constant state of change. For the most part extremely gradual, modifications are nevertheless incessant and can be dramatically reinforced when flooding occurs.

The two major fluvial processes currently making minor modifications to the existing configuration of the river channel are erosion and deposition.

Actively eroding sites are to be found at the base of many riverine escarpments where they are immediately adjacent to the river and on the outside of meander bends. Examples are the base of the Silver Springs escarpment and the escarpment adjacent to the community of Millican-Ogden. Sites can be artifically reinforced at the risk of constricting the river channel.

Notable deposition occurs in the lee of islands in the form of spits and on the inside of meanders. Such areas are first colonized by grasses and shrubs and later by riverine forest. Examples are the large island adjacent to Bowness and Carburn and Beaverdam Parks. The western portion of the latter park in Section 35 (Twp 3, Rge 1, W5M) is recorded in early land titles as consisting of 6 acres. Presently it is 26 acres in size.

A3.4 CULTURAL FEATURES

The main cultural features in the vicinity of the Bow River are Parks, Golf Courses, Residential Areas, Transportation Corridors, Railway Tracks, Commercial and Institutional Uses, Industrial Uses, Sewage Treatment Plants, Agricultural Uses and Snow Disposal Sites.

Farmland, Snow Disposal Sites and Recreational Uses have been discussed in the previous sections. The following is an overview of the remaining major cultural land use features. Land uses adjacent to the river are inventoried in detail in the Land Use Inventory.

A3.4.1 Residential Areas

The only area of the city in which residential lots abut directly onto the watercourse is in the Northwest - in Bowness along Bow Crescent and 48th Avenue N.W. and in Montgomery adjacent to 52nd Street N.W. and downstream of the Trans-Canada Bridge.

Extensive areas of residential land are located ajdacent to the left bank of the Bow River, being separated from it by roads, community reserve lands or other areas of open space. The main areas are parts of Bowness, Montgomery and Bridgeland-Riverside; the Point McKay development; portions of the Downtown residential community and the communities of Parkdale, West Hillhurst, HillhurstSunnyside and Crescent Heights.

There are several areas of residential development located at the top of riverine escarpments which are immediately adjacent to the river. These are the communities of Silver Springs, Wildwood, Spruce Cliff, Millican-Ogden and Queensland Downs.

A3.4.2 Transportation Corridors

The river constitutes a formidable barrier to intra-city access and is crossed by many of the city's main roads. The major road crossings are the Bowness Road (Shouldice Bridge), TransCanada Bridge, Crowchild Trail Bridge, 14th Street (Mewata) Bridge, 10th Street (Louise/Hillhurst) Bridge, Centre Street Bridge, Edmonton Trail (Langevin) Bridges, 17th Avenue S.E. (Cushing) Bridge, Bonnybrook Road Bridge, Glenmore Trail (Graves) Bridge and the Highway 22 (901) Bridge.

Major arterial thoroughfares parallel extensive portions of the river very close to the riverbank. Presently the major routes are the Bow Trail in the eastern portion of Sunalta; the Deerfoot Trail in the vicinity of the W.I.D. canal and the extensive Bowness Road/Parkdale Boulevard/Memorial Drive network which extends from Parkdale to Bridgeland-Riverside. All impinge undesirably on the riverside environment and are aesthetically offensive with the exception of the tree-lined Memorial Drive which has a pleasant "Boulevard" appearance between the 12th and 10A Streets N.W. and 10th and 5th Streets N.W.

The Deerfoot Trail extension will pass very close to the river in the southern portion of the Cominco Natural Area and will make two river crossings, at the 50th Avenue S.E. alignment and by the southern portion of the Canfarge site. The first crossing is under construction.

A3.4.3 Railway Tracks

The CPR tracks cross the river at the Twin Bridges and Bonnybrook Bridges. The CNR tracks cross the river at approximately the 55th Avenue S.W. alignment. The CPR tracks and their embankment parallel the river very close to the riverbank between the Trans-Canada Bridge and the western boundary of Edworthy Park; between the eastern boundary of Edworthy Park and the western boundary of Lowery Gardens and between the eastern boundary of Lowery Gardens and the Crowchild Trail Bridge.

There is an extensive area of sidings located adjacent to the river north of the Bonnybrook Bridges and a branch line to the Gulf Oil Refinery which passes adjacent to the river south of the Inglewood Bird Sanctuary and connects with the sidings.

A3.4.4 Commercial and Institutional Uses

There are numerous scattered commercial and institutional uses located close to the river particularly in the Downtown area, in the southeast portion of Bowness and in the communities on the left bank of the river between Montgomery and Albert Park-Radisson Heights. They are described in detail in the land use inventory.

The only major commercial uses located very close to the river are the two large car dealerships in Sunalta and the Greyhound Bus sheds in the Downtown area.

A3.4.5 Industrial Uses

There are a large number of industrial sites in the vicinity of and located immediately adjacent to the river. The major industrial operations are: Klippert Concrete Ltd., ConForce Products, Russelsteel Gulf Oil, Consolidated Concrete (two locations), Supercrete, Cominco (Conmac), Burnco, Canfarge and Canadian Industries Ltd (C.I.L.). There are two private industrial bridges belonging to Cominco and Canfarge which are not designed to withstand a major flood. All the industrial sites are aesthetically offensive particularly in the southeast portion of the city where there is extensive primary industrial extraction of gravel and in many localities both vegetation and topsoil have been stripped right to the riverside.

A3.4.6 Sewage Treatment Plants

There are two City Sewage Treatment Plants located in the southeast portion of the city at Bonnybrook and Fish Creek. The Bonnybrook Plant is partially screened from the river by the riverine flatlands south of the Bonnybrook Bridges and a line of tall shrubs and mixed poplars on the riverbank to the south of this area. The Fish Creek plant is located about 240 m (800 ft.) from the river and is presently undergoing expansion.

Problems with disagreeable odours are associated with both plants.

B THE ELBOW RIVER

B1 LAND USE INVENTORY

B1.1 NORTH GLENMORE AND SOUTH CALGARY-ALTADORE

(The left bank between Glenmore Dam and the 41st Avenue alignment.)

B1.1.1 Residential

There are about 53 single-family lots located on 14A Street S.W. between 39th Avenue S.W. and 50th Avenue S.W. facing "River Park", which lies at the top of the riverine escarpment between about the 41st Avenue S.W. and 50th Avenue S.W. alignments. The lots which are closest to the river are about 165 m (550 ft.) distant. The Elbow River's 20,300 cfs floodplian is very close to the waterline in this area - that is, at the foot of the escarpment - and so does not affect any properties.

B1.1.2 Institutional

The "Emily Follensbee Elementary School" is situated between 50th Avenue S.W. and the riverine escarpment at 14A Street S.W. The bulding is about 40 m (125 ft.) from the top of the escarpment and about 90 m (300 ft.) from the river

B1.1.3 Recreational Land

Active play and informal sports can take place in the open space below Glenmore Dam, in Sandy Beach, in the Follensbee schoolyard, and in River Park.

Formal sports facilities exist in Glenmore Athletic Park which is located south of 50th Avene S.W. and east of 19th Street SW.

Activities such as walking, cycling, and cross-country skiing can take place in all of the open spaces indicatd above.

B1.1.4 Established Parks and General Open Space

There is an approximately 8 hectare (20 acre) City-owned area of parkland located in the valley immediately below the Genmore Dam which has a central grassed area with treed areas along the river. There is a gravel access road, a gravelled parking area, and an observation terrace overlooking the sluice gates of the Dam. There are no recreational facilities such as trails playing fields etc.

"Glenmore Athletic Park" is an approximately 25 hectare (60 acre) City-owned area located south of 50th Avenue S.W. and east of 19th Street S.W. about 300 m (1,000 ft.) away from the river. There is a race track, a velodrome, a gymnasium, two baseball diamonds, football fields, a hockey rink, tennis courts, and various other playing fields. This park is separated from the river by the vacant area described below.

There is a large, 12 hectare (30 acre) vacant area owned by the City bounded by 50th Avenue S.W., the river, the Glenmore Reservoir water filtering plant, and the 16th Street S.W. alignment. Parts of the area - including the escarpment - are covered with grass and brush, whereas other areas have little vegetation or piles of earth. Several vehicle tracks cross this area.

Between 50th Avenue S.W., the river and about the 13th Street S.W. alignment is an approximately 6 hectare (16 acre) private parkland owned by the City, exclusing two residential properties.

"Sandy Beach" is an approimately 8 hectare (20 acre) Ciy-owned park located in the valley between the river, the escarpment, and 50th Avenue S.W. There are passive recreation facilities: picnic tables, barbeque stands, fire pits, and a picnic shelter; and active play equipment, public washrooms, and two parking areas. An asphat bicycle path leads from the Sandy Beach pedestrian bridge across the park and up the escarpment to 50th Aveue S.W.; from where it extends along the top of the escarpment to Glenmore Dam. There are also motorcycle tracks up the escarpment at the 50th Avenue S.W. alignment. Only a minor part of the area is inside the floodplain.

A City-owned manicured park extends from 38th Avenue S.W. to 50th Avenue S.W. between 14A Street S.W. and the top of the escarpment. It is called "River Park" and covers approximately 22 hectares (55 ares). The park is grassed, with only occasional trees and benches. There are views to the north, east, and south from the top of the escarpment.

The riverine escarpment is adjacent to the river between about the 41st and the 46th Avenue S.W. alignments and is largely bare with only some brush and grass. It is about 18 to 30 m (60 to 100 ft.) high, the slope is about 2:3, and a difficult trail runs along the base, joining Crestview Road and Sandy Beach. The escarpment seprating River Park and Sandy Beach is not as steep as further downstream and is covered with trees brush. All of this escarpment is owned by the City.

B1.1.5 Public Access

There is vehicular access by gravel road close to the base of Glenmore Dam, and by 50th Avenue to the top of the riverbank and to a parking area in Sandy Beach.

There is pedestrian access to and along the river between Glenmore Dam and the 55th Avenue S.W. alignment, in Sandy Beach between the Sandy Beach pedestrian bridge and 50th Avenue S.W., and at the base of the escarpment between about the 41st and 46th Avenue S.W. alignments.

B1.2 ELBOW PARK AND MOUNT ROYAL

(Elbow Park includes the right bank between about the 42nd Avenue S.W. alignment and Elboya Bridge between the 41st Avenue S.W. alignment and Garden Crescent. Mount Royal includes a short section of the left bank between Garden Crescent and 4th Street S.W.)

B1.2.1 Residential

Left Bank: there are three large single-family dwellings located on Crestview Road at the top of the riverine escarpment, about 30 to 50 m (100 to 200 ft.) from the river. The property lines extend to the waterline, which is also approximately the Elbow River's 20,300 cfs floodplain limit.

There are 17 single-family lots located on Sifton Boulevard between Crestview Road and 8th Street S.W. which are separated from the river by Sifton Boulevard. The houses are 30 to 50 m (100 to 175 ft.) from the waterline and the front property lines are about 10 m (25 ft.) closer.

Between the 4A and the 7A Street S.W. alignments there are twenty lots which have ownership to the river. These are mostly large, single-family houses situated 15 to 60 m (50 to 200 ft.) from the waterline.

There are about 18 lots which abut the river between 34th Avenue S.W. and 40th Avenue S.W. Also mostly large, single-family houses, they are situated 10 to 50 m (25 to 175 ft.) from the waterline.

Between 29th Avenue S.W. and 5th Street S.W. there are eleven lots, separated from the river by Elbow Drive. The large single-family houses are 45 to 60 m (150 to 200 ft.) from the river and the front property lines are about 40 m (125 ft.) from the river.

Right Bank: there are about 36 lots along Riverdale Avenue west of Elbow Drive which have ownership to the river and which are entirely within the floodplain limit. These single-family dwellings are from 15 to 45 m (50 to 150 ft.) from the waterline.

B1.2.2 Commercial

A Safeway store with a large parking area and a Super Drugmart store - presently under construction - occupy the block on Elbow Drive between 4th Street S.W. and 5th Street S.W. The Safeway building is about 75 m (250 ft.) from the river and the drugstore is about 45 m (150 ft.). The property lines are about 40 m (125 ft.) from the river.

B1.2.3 Institutional

"Elbow Park School" occupies a block on Sifton Boulevard between 7th Street S.W. and 8th Street S.W. The building is about 45 m (150 ft.) from the river and the property line is about 7 m (25 ft.) closer.

B1.2.4 Recreational Land

Formal children's sports can take place in the Elbow Park schoolyard.

Active play and informal sports can take place also in this schoolyard, in the parkland between the river and 40th Avenue S.W. and Edison Crescent, and in "Woods Park" - the strip of park along the river between 29th Avenue S.W. and 34th Avenue S.W.

Activities such as walking and jogging can take place in the above areas and also along the river between Crestview Road and 8th Street S.W. and between 29th Avenue S.W. and 4th Street S.W.

B1.2.5 Established Parks and General Open Space

Left Bank: from the western boundary of Elbow Park the sinuous Cityowned "River Park" extends upstream on the left bank. This is described in the South Calgary - Altadore section.

At the western boundary of Elbow Park on the right bank is a fairly large, City-owned semi-natural area. It is described in the Britannia section.

The riverbank along Sifton Boulevard between Crestview Road and about 8th Street S.W. is owned by the City and is covered with thick natural vegetation. There is a trail along the street but access is difficult down the bank to the river.

There are two playgrounds - a total of about one hectare (2 acres) - on the Elbow Park School property, located on Sifton Boulevard between 7th Street S.W. and 8th Street S.W.

There is an approximately two hectare (5 acre) strip of City-owned open space along the river between 4A Street S.W. and Edison Crecent which is separated into three sections: south of 40th Avenue S.W. between 4th Street S.W. and 4A Street S.W. is a park with cut grass, large trees, and picnic tables, but no pathway. No easy access to the river exists due to the thick natural vegetation on the bank. South of Edison Crescent and east of 4th Street S.W. is a similar park catering to more intensive use as the manicured grass extends to the river. East of Edison Crescent is a small area, partly vacant and partly treed and with an unimproved appearance.

There are small areas of open space in varying conditions where the northern ends of 4th Street S.W. and 5th Street S.W. and the eastern end of 37th Avenue S.W. meets the river. There are apparently supposed to be similar public spaces at the eastern ends of 36th Avenue S.W. and 38th Avenue S.W., but they are in private use at the present.

A City park between Elbow Drive and the river extending from about 29th Avenue S.W. to 34th Avenue S.W. is called "Woods Park". It is about two hectares (4 acres) in area and is covered with grass and large trees; with natural vegetation along the bank. Between about 29th Avenue S.W. and 30th Avenue S.W. there is a small, formal garden; a small playground for children, a small gravel beach, and a building with public toilets.

There is a narrow City-owned semi-natural area between Elbow Drive and the river extending from about 29th Avenue S.W. to 4th Street S.W. It is largely covered with trees and has an asphalt pathway by the street and a trail by the river. There is a retaining wall and railing parallel to the street in the eastern half of this area.

Right Bank: the approximately five hectare (12 acre) City-owned riverine escarpment which separates the communities of Elbow Park and Britannia is parallel to the right bank and extends between about the 11th Street S.W. alignment and Elbow Drive. It is thickly covered with natural vegetation and has no facilities aside from an asphalt path which descends the slope at 10th Street S.W.

At 8th Street S.W. the right-of-way extends to the river and has manicured grass with some benches. It surrounds the southern end of a pedestrian bridge.

There is a small City-owned semi-natural area djacent to the river immediately to the west of Elbow Drive which has untended grass and trees, and has brush along the riverbank. There are no facilities or trails.

B1.2.6 Public Access

Left Bank: vehicular access to within about 15 m (50 ft.) of the river exists along Sifton Boulevard between Crestview Road and 8th Street S.W. and within about 30 m (100 ft.) on 40th Avenue S.W. and on Edison Crescent. Access exists to within about 15m (50 ft.) of the river at the five cul-de-sacs to the east of Elbow Drive. There is also access to within about 15 to 60 m (50 to 200 ft.) of the river along Elbow Drive between 34th Avenue S.W. and 4th Street S.W.

Pedestrian access exists to the top of the riverbank or to the waterline down the riverine escarpment from Crestview Road, from Sifton Boulevard between Crestview Road and 8th Street S.W., at the park areas south of 40th Avenue S.W. and Edison Crescent, at most of the cul-de-sacs east of Elbow Drive, and along the park between 34th Avenue S.W. and 4th Street S.W.

Right Bank: vehicular access to the river is cut off by the private residential lots along Riverdale Avenue (although there is a parking area in the open space at the westernmost end of the street).

Pedestrian access to the river exists at the westernmost end of Riverdale Avenue, at the 8th Street S.W. alignment, and at the small open space on the west side of Elboya Bridge.

B1.3 MISSION

(The left bank between Mission Bridge and Victoria Bridge.)

B1.3.1 Residential

There are six old single and two-family residences located on 26th Avenue S.W. between 2nd Street S.W. and 4th Street S.W. which are about 45 m (150 ft.) from the river. The property lines are about 30 m (100 ft.) from the waterline.

On 26th Avenue S.W. between 1st Street S.W. and 2nd STreet S.W. are located three single and two-family residences which are about 40 m (125 ft.) from the river and the property lines of which are approximately 30 m (100 ft.) from the waterline.

Between the 1st Street S.W. alignment and 20th Avenue S.W. there are nine lots which have ownership to the river and are entirely within the floodplain limit. The single-family houses vary from 10 to 45 m (30 to 150 ft.) from the waterline.

Located immediately west of 1st Street S.W. is a rooming house which is about 30 m (100 ft.) from the river and is the floodplain. The property line extends to the waterline.

B1.3.2 Multiple-Family Housing

There are four apartment buildings located on 26th Avenue S.W. between 1st Street S.W. and 4th Street S.W. Two of the buildings are being completed in 1978, one of these is a 4 and 17-storey condominium project called "Roxboro House". The buildings are about 40 m (125 ft.) from the river and the property lines are approximately 30 m (100 ft.) from the river. These lots east of 1st Street S.W. are inside the floodplain.

Between the 1st Street S.W. alignment and 20th Avenue S.W. there are 18 apartment buildings which have ownership to the waterline (except perhaps for the easternmost building south of 25th Avenue S.W.). The buildings - which vary from 2 to 13 storeys - are from 7 to 30 m (25 to 100 ft.) from the waterline.

There is an apartment building located on Park Road between 1st Street S.E. and 2nd Street S.E. the property line of which extends to the river. The building is about 6 m (25 ft.) from the waterline and is on the edge of the floodplain boundary.

B1.3.3 Commercial

The condominium project situated on the corner of 26th Avenue S.W. and 4th Street S.W. - which was described above - has some stores on the ground floor.

Located on Park Road between 1st Street S.E. and 2nd Street S.W. are a commercial building and a motel which have ownership to the waterline. The buildings are situated about 15 m (50 ft.) from the river, lying on the edge of the floodplain boundary.

B1.3.4 Industrial

The CNR station located on the southeast corner of 18th Avenue S.W. and 1st Street S.W. is the only industrial land in Mission. The station, now abandoned, is listed as a Potential Heritage Site by the City of Calgary. The building is situated about 30 m (100 ft.) from the river on the edge of the floodplain limit. The property extends to the waterline.

B1.3.5 Institutional

The "Holy Cross Hospital" is a large complex of buildings situated between 1st Street S.W. and 2nd Street S.W. The closest building to the river is a multiple-storey structure, situated approximately 40 m (125 ft.) from the waterline. Separated from the river by a public street called Holy Cross Lane, the property is on the edge of the floodplain.

There is a large approximately 3 1/2 block area between 1st Street S.E. and 2nd Street S.W. and between 18th Avenue S.W. and the river which is owned by the Roman Catholic Church. The main buildings are St. Mary's school (all grades), St. Mary's Cathedral and the bishopric, and the Sacred Heart Convent. The convent, the Cathedral, and the high school building are about 15 to 45 m (50 to 150 ft.) from the waterline and are on the edge of the floodplain boundary.

B1.3.6 Recreational Land

Active play and informal sports can take place on a City playground located on 24th Avenue S.W. about a block from the river and in a small City park on the west side of 1st Street S.W. There are also school playfields on 2nd Street S.W. and on 18th Avenue S.W.

Activities such as walking and cycling can take place along the City-owned riverbank between 1st Street S.W. and 4th Street S.W. and between 25th Avenue S.W. and 26th Avenue S.W. where an easement exists and an asphalt pathway parallels the riverbank through private property.

B1.3.7 Established Parks and General Open Space

There is a narrow strip of City-owned parkland between 26th Avenue S.W. and the river extending from 1st Street S.W. to 4th Street S.W. There are two pathways, an asphalt one adjacent to the street and a trail along the riverbank. Vegetation consists of manicured grass, trees and natural vegetation.

There are small parcels of open space where 19th, 21st, 23rd, 24th, and 26th Avenues S.W. and Holy Cross Lane meet the river.

Private schoolyards adjacent to the river exist on 2nd Street S.W. at 20th Avenue S.W. and between 18th Avenue S.W. and the river.

There is a small, City-owned manicured park adjacent to the river on the west side of 1st Street S.E. It has benches and a lawn extending to the water.

B1.3.8 Public Access

Vehicular access to within about 15 m (50 ft.) of the river is possible between 26th Avenue S.W. and the Holy Cross Land, and at the cul-de-sacs of 19th, 21st, 23rd, 24th, and 26th Avenues S.W.

Pedestrian access exists to and along the river at the same places as above, and at the park adjacent to the river at 1st Street S.E.

B1.4 VICTORIA AND STAMPEDE PARK

(The left bank between Victoria Bridge and the CPR mainline bridge)

B1.4.1 Residential

There are two old single-family houses located at the southwest corner of 13th Avenue S.E. and 6th Street S.E. The buildings and the property lines are about 60 m (200 ft.) from the river.

On the northwest corner of 13th Avenue S.E. and 6th Street S.E. is a new two-storey senior citizen's residence called "Rundle Lodge", which is operated by the Metropolitan Calgary Foundation. The building is located about 90 m (300 ft.) from the river.

A new, three-storey apartment building is located immediately west of the two houses described above. The building and the property line are about 75 m (250 ft.) from the river.

B1.4.2 Commercial

"Stampede Park" is an approximately 40 hectare (100 acre) parcel of City-owned land located south of 17th Avenue S.E. and east of Macleod Trail (2nd Street East). It is being included here as part of the community of Victoria and is labelled as a Commercial use since most of the activities taking place throughout the year are of a commercial nature, the biggest being the "Calgary Exhibition and Stampede". The property borders the river between Victoria Bridge and 14th Avenue S.E. There is a park designed for Stampede patrons which extends for about 210 m (700 ft.) downstream from the 3rd Avenue S.E. alignment along the riverbank.

B1.4.3 Industrial

A large area of land owned by the CPR at the north end of the community is separated from the river by 7th Street S.E. It is leased in smaller parcels to various firms for industrial purposes, for example, "Consolidated Fastfrate" and "Aqua Soft Service". There are about five large buildings which are less than 60 m (200 ft.) from the river.

B1.4.4 Recreational Land

Active play and sports can take place in the playground on 6th Street S.E. There are play facilities and a baseball diamond.

Activities such as walking, jogging, and cycling are possible along an asphalt pathway which extends along the top of the riverbank between 9th Avenue S.E. and 12th Avenue S.E. There is a trail between 12th Avenue S.E. and 14th Avenue S.E.

B1.4.5 Established Parks and General Open Space

There is a 1.5 hectare (3 acre) playground situated between 12th Avenue S.E. and 6th Street S.E. and the river. It is fenced off from the streets and the river and has play and sports facilities. The Victoria community is proposing to use this area as the community centre and playground.

Two narrow strips of parkland along the river inside Stampede Park are private.

B1.4.6 Public Access

Vehicular access to the top of the riverbank is possible along 7th Street S.E. between 9th Avenue S.E. and 12th Avenue S.E. and at the 6th Street S.E. and 14th Avenue S.E. corner.

Pedestrian access is possible along the top of the riverbank between 9th Avenue S.E. and 14th Avenue S.E. on an asphalt pathway and on trails. Pathways along the river in Stampede Park are private and fenced from the river.

B1.5 MAYFAIR-BEL AIRE, BRITANNIA, AND THE CALGARY GOLF AND COUNTRY CLUB

(The right bank between Glenmore Dam and about the 42nd Avenue alignment).

B1.5.1 Residential

At about the 58th Avenue S.W. alignment there are two large, single-family houses situated about 75 m (250 ft.) from the river. The rear property lines are approximately 30 m (100 ft.) from the top of the riverine escarpment and about 60 m (200 ft.) from the waterline.

A 31-unit detached residential project is proposed for most of the approximately 4 hectare (11 acre) Graburn Estate, which adjoins the top of the escarpment between the 14th Street S.W. and 58th Avenue S.W. alignments.

There are twenty single-family houses located on Britannia Drive between the 44th Avenue S.W. and 50th Avenue S.W. alignments where the street is adjacent to the top of the escarpment. The front property lines are from 20 to 45 m (75 to 150 ft.) from the top of the escarpment, but only 15 properties are less than 150 m (500 ft.) from the river.

B1.5.2 Recreational Land

Active play and informal sports can take place on the open space situated between Glenmore Dam Bridge Road and the 14th Street S.W. alignment. Active play can take place in the open space adjacent to the river between about the 42nd Avenue S.W. and 47th Avenue S.W. alignments.

Golfing facilities in the Calgary Golf and Country Club are available to members and guests only.

Walking, jogging, cross-country skiing, etc., are possible in the open space between the 42nd Avenue S.W. and 47th Avenue S.W. alignments.

B1.5.3 Established Parks and General Open Space

There is a City-owned semi-natural area of parkland located at the top of the escarpment between Glenmore Bridge Road and the 14th Street S.W. alignment which is about 2 hectares (5 acres) in area. The ground is covered with generally untended grass. A chain link fence cuts off access to the escarpment.

The Graburn Estate borders the top of the escarpment between the 14th Street S.W. and 58th Avenue S.W. alignments and is presently a 4 hectare (10 acre) private landscaped area surrounding a house. The escarpment itself is covered with natural vegetation.

The Calgary Golf and Country Club occupies a privately-owned 49 hectare (123 acre) property which abuts the river between the 50th Avenue S.W. and 58th Avenue S.W. alignments. This is an 18-hole golf course, a large two-storey clubhouse, and a parking area. The building is located at the 54th Avenue S.W. alignment about 75m (250 ft.) from the river. The property is private - there are fences to the escarpment at the northern and southern boundaires - and therefore no public access to this part of the river is available.

From the 44th Avenue S.W. to the 50th Avenue S.W. alignments there is a narrow strip of City-owned parkland between the top of the escarpment and Britannia Drive. It is covered with grass and there are no facilities, but there are views to the north, west , and south.

There is an approximately 8 hectare (20 acre) semi-natural area between the escarpment and the river and between about the 42nd Avenue S.W. and the 46th Avenue S.W. alignments which is owned by the City. There is a hockey rink and a parking area near the 42nd Avenue S.W. alignment (the southern edge of the Elbow Park community), and an asphalt pathway which connects the parking area and Riverdale Avenue with the Sandy Beach Bridge. The vegetation varies from trees by the river to grass in the central flat area, and brush on the escarpment. This area is largely inside the floodplain.

The portion of City-owned riverine escarpment is adjacent to the river between the 46th Avenue S.W. alignment and Glenmore Dam. The MayfairBel Aire portion (upstream of the 58th Avenue S.W. alignment) is about 30 m (100 ft.) high and has a slope of 2:3. It is largely covered with trees and is fenced off. The Britannia portion (downstream of 50th Avenue S.W.) is about 30 m (100 ft.) high and has a slope varying from 2:3 to 1:3. The steeper part is generally bare of vegetation whilst the gentler part is covered with grass and brush and is crossed by trails.

B1.5.4 Public Access

Vehicular access is possible to within 15 to 30 m (50 to 100 ft.) at the top of the escarpment and 60 to 120 m (200 to 400 ft.) of the river on Britannia Drive between the 46th Avenue S.W. alignment and 50th Avenue S.W. A parking area at the western end of Riverdale Avenue is approximately 60 m (200 ft.) from the waterline and is within the floodplain limit.

There is pedestrian access to the top of the escarpment between Glenmore Dam Bridge Road and the 14th Street S.W. alignment but a chain link fence cuts off access to the river. There is easy access to and along the riverbank between about the 42nd and the 47th Avenue S.W. alignments and there are trails down the escarpment from Britannia to the river.

B1.6 PARKHILL-STANLEY PARK

(The right bank between Elboya Bridge and the 37th Avenue alignment.)

B1.6.1 Residential

Twenty-two properties located on Riverdale Avenue S.W. between Elbow Drive and 4th Street S.W. are separated from the river by Riverdale Avenue. The houses - most of which are single-family dwellings - are about 45 m (150 ft.) from the waterline and the property lines are about 35 m (125 ft.) from the waterline. The five easterly properties are within the Elbow River's 20,300 cfs floodplain limit.

There are houses situated at the top of the riverine escarpment between 36th Avenue S.W. and 40th Avenue S.W. which are about 90 to 120 m (300 to 400 ft.) from the river.

B1.6.2 Recreational Land

Most types of active play and sports can take place in "Stanley Park", which is bounded by the river, the escarpment, and 4th Street S.W.

Activities such as walking, jogging, and cycling can also take place in Stanley Park and along the escarpment extending downstream from there to Rideau Park.

B1.6.3 Established Parks and General Open Space

Stanley Park is an approximately 11 hectare (28 acre), City-owned recreationally-oriented park situated adjacent to the river between 4th Street S.W. and the escarpment. There are such facilities as swimming, diving, and wading pools; tennis courts; a baseball diamond; etc., and there is sufficient open space for informal sports. A gently-sloping, grass covered bank which is used for sunbathing extends along a portion of the park's river frontage. Supervised swimming is also possible in the river at this point. There are parking areas and the main access points are from 4th Street S.W., Park Avenue, and 42nd Avenue S.W. The park is entirely within the floodplain limit.

The riverine escarpment is owned by the City and is adjacent to the river between 33rd Avenue S.W. and 40th Avenue S.W. It is about 22 m (75 ft.) high with an approximate slope of 1:4 and so is passable to agile people on foot. The vegetation cover is mostly brush and grass but there are several bare areas covered with gravel. Parts of the slope above the waterline are covered with concrete riprap. An asphalt pathway extends from 33rd Avenue S.W. along this escarpment, through Stanley Park, and along Riverdale Avenue at the top of the riverbank.

There is a narrow strip of City-owned parkland between Riverdale Avenue and the river extending from Elbow Drive to Stanley Park. There is manicured grass and an asphalt path along the top of the bank and thick natural vegetation on the bank itself.

B1.6.4 Public Access

There is vehicular access close to the top of the riverbank and about 15 m (50 ft.) from the river along Riverdale Avenue between Elbow Drive and 4th Street S.W. There is access to the top of the escarpment on 36th Avenue S.W., 37th Avenue S.W., and 1A Street S.W., from where there are views to the west.

Pedestrian access is possible to and along the riverbank on the entire river frontage of the community since it is all public open space.

B1.7 RIDEAU PARK-ROXBORO

(The right bank between the 37th Avenue alignment and the Centre Street alignment.)

B1.7.1 Residential

There are about 67 single-family houses, most of which are about 30 to 40 years old, located on Rideau Road and Roxboro Road. The property lines all extend to the waterline and the houses vary from 12 to 40 m (40 to 125 ft.) from the river. The above properties, and the remaining parts of the community east of 5 Street S.W. are within the Elbow River's 20,300 cfs floodplain.

B1.7.2 Institutional

The CFAC radio station is housed in a two-storey building located at the corner of Rideau Road and 33rd Avenue. The building and the property line are about 45 m (150 ft.) from the river.

"Rideau Park School" is situated at the foot of the riverine escarpment at 31st Avenue S.W. It has approximately 1 hectare (2 acre) schoolyard.

Located on the southeast corner of Rideau Road and 5A Street S.W. is a one-storey scout hall. The building and the property line are about 60 m (200 ft.) from the river.

B1.7.3 Recreational Land

Active play and sports can take place in the Rideau Park schoolyard and in Roxboro Park.

Activities such as walking, jogging, and cross-country skiing can take place along the riverbank open space extending upstream of 33rd Avenue S.W., in the Elbow Island Park, and in Roxboro Park.

B1.7.4 Established Parks and General Open Space

Upstream of 33rd Avenue S.W. and the CFAC station, the escarpment adjacent to the river is City-owned. The slope is steep within the community boundaries and covered with grasses and brush. Several metres above the river there is an asphalt pathway which connects Rideau Road and Stanley Park, and extending up the escarpment are various trails.

Immediately south of 33rd Avenue S.W. there is a City-owned open space used as a parking area by CFAC and a small area of natural vegetation adjacent to the river. There are also two small brush-covered islands in the river at this point.

Between 31st Avenue S.W. and 32nd Avenue S.W. there is a small piece of City-owned open space at the riverbank which accommodates the eastern end of the pedestrian bridge to Woods Park.

Roxboro Park is an approximately three hectare (7 acre) City-owned area situated between Roxboro Glen Road and the foot of the escarpment which is covered with large trees and manicured grass. The only facilities are a couple of tennis courts by 30th Avenue S.W. A trail leads downstream towards 25th Avenue S.W. from the northeast corner of the park.

There are two large islands in the river upstream of Mission Bridge which are owned by the City and form the Elbow Island Park. The only access is by a wooden stairway from the Bridge. A small, wooden bridge connects the islands and a red shale pathway with benches along it makes a circuit of the park. The area of these two islands is about two hectares (5 acres).

B1.7.5 Public Access

Vehicular access is only possible to about 30 to 60 m (100 to 200 ft.) from the river, except for a public right-of-way which extends to the top of the escarpment at 2nd Street S.W.

Pedestrian access exists to the river on the City-owned land upstream of 33rd Avenue S.W., at the Woods Park pedestrian bridge, at the 2nd Street S.W. right-of-way, and in Roxboro Park. There is also access to the river in the Elbow Island Park.

B1.8 ERLTON

(The right bank between the 28th Avenue S.E. alignment and Spiller Road.)

B1.8.1 Residential

All of these are old, single-family houses (except for a few old duplexes) and are within the Elbow River's 20,300 cfs floodplain limit.

There are nine houses on Centre Street between 22nd Avenue S.E. and 24th Avenue S.E. The northern four are privately-owned and do not have ownership to the river. These four houses are from 30 to 45 m (100 to 150 ft.) and the property lines from 15 to 30 m (50 to 100 ft.) from the waterline. The southern five houses are owned by the City and are 15 to 25 m (50 to 75 ft.) from the waterline.

Between 24th Avenue S.E. and 26th Avenue S.E. there are 16 houses which are less than 60 m (200 ft.) from the river, twelve of which are owned by the City. One of the private lots has ownership to the waterline but is fenced back to allow public access along the riverbank. The other lots abutting the river are owned by the City and the houses are 15 to 40 m (50 to 125 ft.) from the waterline.

There are lots on 1st Street S.E. between 26th Avenue S.E. and 27th Avenue S.E. which have ownership to the waterline. Two of these are owned by the City. The private lots are fenced along the top of the steep riverbank - making access difficult.

B1.8.2 Commercial

The "Eze Brew Catering Co." is a one-storey building located immediately east of Macleod Trail and about 60 m (200 ft.) from the river. The property is owned by the City.

B1.8.3 Industrial

Between Spiller Road and Macleod Trail a CNR line parallels the river at a distance of 20 to 90 m (75 to 300 ft.). A large part of the area between Macleod Trail, 22nd Avenue S.E., and the river - known as Lindsay Park - is owned by the City. This property does not extend to the river and public access exists along the City-owned riverbank between Spiller Road and 22nd Avenue S.E. Major part of Lindsay Park is within the flood plain (20,300 cfs).

B1.8.4 Institutional

There is a Roman Catholic Church property abutting the river between the 27th and 28th Avenue S.E. alignments. No fence delineates this property's part of the escarpment and consequently public access exists along the riverbank. The monastery and a cemetary are located at the top of the escarpment, the monastery building being about 60 m (200 ft.) from the waterline.

B1.8.5 Recreational Land

Informal active play and sports can take place on the City-owned semi-natural areas next to the river north of 22nd Avenue S.E.

Activities such as walking, jogging, cycling, and cross-country skiing can take place in the Elbow River Park along the river downstream of Victoria Bridge, in the City-owned areas described above, and along the public right-of-way by the river between 22nd Avenue S.E. and 26th Avenue S.E.

B1.8.6 Established Parks and General Open Space

A public right-of-way about 12 m (39.4 ft.) in width, extends along the riverbank between 22nd Avenue S.E. and 26th Avenue S.E. interrupted by one private property with no right-of-way which allows only about 7 m (20 ft.) of access. There are large trees along the bank and a red shale pathway.

At the northern end of this strip of parkland - at 22nd Avenue S.E. - a small area of park is fenced - presumably to cut off vehicular access to the riverbank at that location and along the right-of-way.

North of 22nd Avenue S.E. and west of the CNR right-of-way is the approximately two hectare (5 acre) City-owned part of the area called "Lindsay Park". It consists of a central grassed open space disturbed by vehicle tracks and the tree and brush-covered riverbank, which is cut by several trails. There is unrestricted vehicular access from 22nd Avenue S.E.

On the north side of the CNR yard the riverbank is lined by trees and brush. There are trails and a vehicle track, allowing pedestrian access to the river.

Between Macleod Trail and the river from Pattison Bridge to Victoria Bridge is an isolated piece of landscaped park with cut grass, large trees, and benches.

The Kinsmen's Elbow River Park is a narrow strip of land about 45 m (150 ft.) wide extending along the north side of the CNR right-of-way between Macleod Trail and Spiller Road. To the west of the Stampede pedestrian bridge is a paved parking area and to the east is the Stampede's "Indian Village", which is parkland in the off-season.

B1.8.7 Public Access

Vehicular access exists to the top of the riverbank at the western end of 24th Avenue S.E., and informal access to within 30 m (100 ft.) of the river adjacent to Lindsay Park.

There is informal pedestrian access along the top and bottom of the riverbank upstream of 26th Avenue S.E. and along the river bank adjacent to Lindsay Park. Formal access along the right-of-way between 22nd Avenue S.E. and 26th Avenue S.E. exists on the bank between the two Macleod Trail bridges, and in Elbow River Park.

B1.9 RAMSAY

(The right bank between the 26th Avenue S.E. alignment and the CPR mainline bridge.)

B1.9.1 Residential

There are five properties located on 6th Street S.E. which have no ownership down the escarpment to the river, but there is no fencing to the waterline. Four more houses on 6th Street S.E. do not have ownership to the river. All of these houses are situated on the top of the riverine escarpment about 45 to 75 m (150 to 250 ft.) from the waterline.

There are about 39 properties on the eastern side of 6th Street S.E. and Salibsury Avenue, both of which are close to the top of the escarpment (which is called Scotsman's Hill). The houses and front property lines vary from 75 to 180 m (250 to 600 ft.) from the waterline.

In addition, there are 11 houses fronting on 8th Street S.E., Maggie Street, and McDonald Avenue (12th Avenue S.E.) which are located 45 to 90 m (150 to 300 ft.) from the river. The property lines are a little closer to the river: about 30 to 60 m (100 to 200 ft.). All of these properties are outside of the Elbow River's 20,300 cfs floodplain.

B1.9.2 Commercial

There is a grocery store located at the corner of Bellevue Avenue and McDonald Avenue which is about 90 m (300 ft.) from the river and outside of the floodplain.

Situated on 8th Street S.E. by Adelaide Street is a gas station and car wash. The property line extends to about 15 m (50 ft.) from the waterline and the main building is about 40 m (125 ft.) from the river.

At the foot of the escarpment there are 11 horse barns located between the 13th and 18th Avenue S.E. alignments and one at the 25th Avenue S.E. alignment. These are part of the Stampede facilities and are connected to the main grounds by two bridges. There are also two outside storage areas at about the 18th and 26th Avenue S.E. alignments. Extending from the 14th to 18th

Avenue S.E. alignments between the livestock buildings and the river is a strip of land used by itinerant rodeo workers to park their trailers and mobile homes. The barns vary from 30 to 60 m (100 to 200 ft.) from the waterline whereas the parked trailers are less than 30 m (100 ft.) from the waterline. All of these structures at the foot of the escarpment are on the edge of the floodplain.

B1.9.3 Industrial

The CPR mainline crosses the river at the northern end of the community and a CNR spur line adjacent to the river marks the southern end.

B1.9.4 Institutional

A "Jehovah's Witnesses" Church is located on McDonald Avenue (12th Avenue S.E.) about 20 m (75 ft.) from the river. The building and property line are situated a few metres outside the floodplain limit.

B1.9.5 Recreational Land

Active play can take place in the parkland upstream of McDonald Bridge which is part of the Elbow River Park.

Activities such as walking, jogging, and cycling can take place on the asphalt pathway which extends from McDonald Bridge to Victoria Bridge and is at the top of the riverbank.

B1.9.6 Established Parks and General Open Space

The approximately five hectare (12 acre) strip of City-owned land along the river between Victoria Bridge and McDonald Bridge is called the "Kinsmen Elbow River Park". The Stampede utilizes most of the wider areas at the foot of the escarpment between the 13th and 25th Avenue S.E. alignments for livestock barns. Nevertheless, an asphalt pathway extends along the riverbank beside these buildings. A narrow strip of park adjacent to the river extends between the northernmost private Stampede bridge (about the 18th Avenue alignment) and McDonald Bridge. This has cut grass and large trees and appears to be used mostly by the families of the itinerant Stampede workers.

Between the 13th and 24th Avenue S.E. alignments is the river escarpment known as "Scotsman's Hill". It is steep; with an approximately 1:3 to 2:3 slope, and is about 30 m (100 ft.) high. The northern part has only grasses and brush and is experiencing some land slippage. The southern part has more natural areas with trees and brush.

B1.9.7 Public Access

Salisbury Avenue and 8th Street S.E. are located parallel and adjacent to the top of the escarpment. There are views of the downtown part of Calgary and the mountains to the west. The northern end of Maggie Street is a cul-de-sac with space for parking which is located about 30 m (100 ft.) from the river.

Pedestrian access to the river is possible along the asphalt pathway which extends along the riverbank upstream of McDonald Bridge. Pedestrian access down the escarpment from 8th Street S.E. and Salisbury Avenue is restricted by the steepness of the slope.

B1.10 INGLEWOOD

B1.10.1 Residential

There are three old, single-family houses on 8th Street S.E., which are about 70 m (225 ft.) from the Elbow's waterline. These are at the edge of the Elbow/Bow floodplain.

On the northeast corner of 9th Avenue S.E. and 8th Street S.E. is the old, four-storey McGill Block, which has newly-renovated apartments on the upper floors. The building is about 80 m (275 ft.) from the Elbow's waterline and is within the Elbow/Bow floodplain.

B1.10.2 Commercial

The McGill Block has stores on the ground floor. Located on the southeast corner of 9th Avenue S.E. and 8th Street S.E. is a three-storey commercial building which is about 90 m (300 ft.) from the waterline and it is located at the edge of the Elbow/Bow floodplain.

B1.10.3 Industrial

The CPR mainline crosses the Elbow about 40 m (125 ft.) upstream of the 9th Avenue S.E. Bridge. the eastern abutment of the bridge constricts the Elbow River's 20,300 cfs floodplain.

B1.10.4 Institutional

Two old single-family houses are located in that part of Fort Calgary Park east of the Elbow River. They are described below under "Historical". The "Deane House" also houses the "Dandelion Gallery".

B1.10.5 Recreational Land

Informal active play can take place in the eastern part of Fort Calgary Park.

Activities such as walking, jogging, cross-country skiing, and picnicking are also possible in this park.

B1.10.6 Established Parks and General Open Space

The part of Fort Calgary Park east of the Elbow River is about 1.5 hectares (3 acres) in area, extending along the total length of Inglewood's frontage with the Elbow River between the 9th Avenue S.E. bridge and the confluence. It is grassed and has large trees, a red shale pathway, and two historical houses. At the confluence it joins a strip of parkland which extends along the Bow's bank to 13th Street S.E. The Elbow's bank is steep and high in this area.

Adjacent to the Elbow between the 9th Avenue S.E. Bridge and the CPR mainline bridge is a small area of land which is presently vacant and in the process of being filled.

B1.10.7 Public Access

8th Street S.E. parallels the Elbow River at a distance of 45 to 60 m (150 to 200 ft.). Parking on the street is possible north of 9th Avenue S.E.

Pedestrian access exists in Fort Calgary Park but access down the riverine bank is difficult due to its steepness. There is also informal access along the bank upstream of 9th Avenue S.E.

B2 LAND USE ANALYSIS

B2.1 NORTH GLENMORE

B2.1.1 General Description of the Community

North Glenmore is located on the uplands west of the Elbow River. It is a residential area of more recent construction than adjacent Altadore. The riverine escarpment and Glenmore Athletic Park separate the community from the river. The park occupies about 25 hectares (60 acres) of City land located south of 50th Avenue S.W. and east of 19th Street S.W. and posseses public facilities for various sports. A small area of City Parkland exists at the base of the river valley below the Glenmore Reservoir.

A few public buildings are located close to the river. The Glenmore Reservoir Pumping Station and Water Treatment Plant, the Emily Follensbee Elementary School and an electric transformer station are all situated at the top of the escarpment.

B2.1.2 Relationship to the River

Distance, the proximity of Glenmore Reservoir, adverse topography and the present nature of land use all impede the utilization of the riverine environment by North Glenmore residents.

The North Glenmore community is located approximately 800 m from the river, immediately adjacent to the northern portion of the Glenmore reservoir. The river's escarpment is high and steep, blocking visibility of the river by the community. The land adjoining the top of the escarpment is either occupied by the utility buildings or left vacant. The park is set back from the edge of the escarpment. All the land abutting the river is city owned but only the small area of valley bottom parkland is oriented towards the river.

B2.1.3 Public Access to the River

Immediately below the Glenmore Dam the modrate grade of the escarpment allows vehicular access via a gravel road to the river valley parkland area. A pedestrian trail also provides access to this area. A trail parallels the rim of the escarpment, giving good views of the river and linking this area with the next accessible part of the river valley downstream.

Elsewhere acess is restricted. No vehicular access is possible to the steeper edge of the escarpment and the severity of the descent inhibits pedestrian access to the riverside.

B2.1.4 Condition of the Riverbank Area

The Glenmore Dam parkland area is subjected to uncontrolled human activity but retains fairly dense areas of trees and low shrubs near the river. Located on the inside of a river meander, the riverbank is low, permitting close contact with the river.

Natural and human pressures have resulted in the disfiguration of several areas. The steepest parts of the escarpment adjoin the river on the outside of a meander. Due to erosion, they have little vegetative cover. Indiscriminate vehicular use has had a detrimental effect on both non-native grasses in the central part of the riverbank park and on City owned open space located between the Athletic Park and escarpment. This latter area now retains only patches of low shrubs and non-native grass and is additionally defaced by the presence of dirt and concrete rubble. Aesthetically this is an area of considerable contrasts.

B2.2 SOUTH CALGARY - ALTADORE

B2.2.1 General Description of the Community

South Calgary - Altadore is a large established community dating mainly from the 1940's and 1950's. It is located on the uplands close to the top of the riverine escarpment, which slopes directly to the river along the community's frontage. River Park separates the community from the escarpment. Views from the edge of the escarpment encompass the river valley but both the height of the escarpment and width of the park prevent direct viewing of the river by community residents.

The 25,000 cfs floodplain limit lies at the bottom of the deep narrow valley and does not affect the community. The flood plain does affect a portion of 'Sandy Beach' park.

Although the community boundaries do not extend to the river, for the purposes of this report the length of the riverbank is defined as extending from the 19th Street S.W. alignment to approximately the 41st Avenue S.W. alignment, a reach of about 2 km.

B2.2.2 Relationship to the River

Whilst River Park acts as a water enhanced recreation area by virtue of the excellent river views to be had from the escarpment edge, it is the Sandy Beach park, located within the river valley, which serves both the nearby community and the city as a whole by functioning as a riverbank oriented family recreation area.

Recreational use in the valley bottom is limited as half the area was long privately owned and fenced off. The City has recently acquired the majority of this land. Views of the river are impaired by heavy tree growth on these properties.

B2.2.3 Public Access to the River

The only direct vehicular access to the river is via a road leading down the escarpment from 50th Avenue S.W. to Sandy Beach's parking areas and the adjacent valley bottom properties. Above the escarpment 14A Street S.W. parallels River Park, acting as a boulevard and providing a park experience for the passerby.

Pedestrian pathways link Sandy Beach to the escarpment and River Park and also to Riverdale Avenue across the river via Sandy Beach pedestrian bridge. Beyond the park riverbank access is limited, private ownership and the North Glenmore Community's precipitous escarpment permit downstream access only for the agile.

A ravine at the north end of River Park leads to an isolated point of contact with the river. Basically a dead end, it does allow a bucolic experience in a forested setting by the river.

B2.2.4 Condition of the Riverbank Area

Sandy Beach and the adjoining private properties both have central areas of planted grass with Balsam Poplars and low shrub bordering naturally appearing riverbanks.

The escarpment has not been seriously affected by human activity. The moderate slopes have a low shrub covering but the steeper parts are bare due to the effects of river erosion.

B2.3 ELBOW PARK AND MOUNT ROYAL

B2.3.1 General Description of the Community

Elbow Park is a reasonably well maintained residential community dating mainly from the inter-war period. It has the largest river frontage of all communities along the Elbow River, but has little designated orientation towards the river. Private properties back onto over half of the reach and some riverbank open space is not developed.

The greater part of Mount Royal is situated on the upland area west of the valley and has no orientation towards the Elbow River. It does adjoin the left bank of the river for a short distance (about 300 m) between Garden Crescent and 4th Street West. Here, the riverbank is parkland, with houses and some commercial establishments facing onto it across Elbow Drive.

The valley is wider along this reach than it is upstream, having a broad flood plain that includes most of Elbow Park and the small riverside portion of Mount Royal within its limits.

B2.3.2 Relationship to the River

The residential communities of this area have a varied degree of relationship towards the river. For the most part there is a lack of planned river orientation with dead ends at the river bank east of Elbow Drive and limited visual access. To the west of Elbow Drive there are private properties immediately adjacent to both banks of the river. This is the only section of the Elbow River where visual access is denied to the public on both sides of the watercourse.

Conversely, a short length of landscaped riverbank by Edison Crescent is one of the few parts of the Elbow River where a community has a close physical relationship with the river. Its aesthetic value is enhanced by the presene of a similar area across the river, the Stanley Park riverbank. Visual access to the river also exists at Woods Park, a narrow strip of landscaped park between Elbow Drive and the river, and along portions of both Sifton Boulevard and Elbow Drive. Two vehicular and two pedestrian bridges strengthen regional visual contact with the Elbow River and the physical connection between the two riverbanks and their respective communities.

B2.3.3 Public Access to the River

Elbow Drive, Sifton Boulevard, and Riverdale Avenue all parallel the river. River Avenue is separated from the river by private residences and on-street parking is possible althouh the only public parking area serving the riverbank is located at the west end of Riverdale Avenue in the Britannia Community's floodplain parkland.

Pedestrian access is limited. Pathways facilitate access along most of the public riverbank but the large sections of private riverbank break the continuity of the pathway system, forcing pedestrians and cyclists to detour along back streets. The vehicular bridges bisect public rights-of-way and in Woods Park, despite the long stretch of riverbank, easy access to the waterside is confined to only one point.

B2.3.4 Condition of the Riverbank Area

The public stretches of the riverbank are generally covered with thick natural vegetation and have an abrupt slope. Neither factor facilitates public use of the riverside. Intensive summer recreatioal use of both Edison Crescent Park and Stanley Park, concomitant with the lack of riverside users along this reach, indicates the popular public preference for a gently grassed riverbank.

The private properties vary in their treatment of the riverbank from naturally vegetated to landscaped and manicured.

The overall condition of the riverbanks in the reach give the river a surprisingly natural appearance in view of it's urban setting.

B2.4 MISSION

B2.4.1 General Description of the Community

Mission is an older area dating from the late 1900's and containing various distinct types of land use. The area is bound by Stampede Park to the east, 18th Avenue to the north and 4th Street S.W. to the west. Three major streets carrying heavy traffic loads affect the area - 4th Street S.W., 2nd Street S.W., and 25th Avenue S.W.

The area's core is dominated by old orginal single family houses, classified R-4 and R-5 which does not encourage high maintenance levels. In the river's residential areas new high and low-rise apartment buildings predominate. The centrally located Holy Cross Hospital occupes two blocks. The Roman Catholic Church owns schools, a cathedral and convent at the north end of the community. To the west of 4th Street S.W. is a regional commercial and service street lined with several high rise buildings.

The older residential environment has been severely disrupted, giving way to a busy, inner-city environment. Fortunately the river has been largely unaffected and remains as the major physical amenity of the area.

B2.4.2 Relationship to the River

The Mission community has no planned orientation towards the river, beig composed of a grid of streets with no modification at the river- side. The riverbank is substantially privately owned and public ownership is mostly limited to small open spaces where streets terminate at the riverbank.

The pattern of land ownership and planned community orientation adversely affects the nature of the community relationship with the river. There is a two block stretch of riverbank parkland adjacent to 26th Avenue S.W. which is the most visually accessible part of the reach. Also, low riverbanks throughout the reach facilitate casual views of the river from street level. Some residents of the high-rise apartments have good views of the river. For the most part, however, residents are relatively isolated rom the riverbank as housing is predominantly located away from the river. The hospital, schools, and new apartment buildings occupy much of the riverside land.

Half the road bridges along the Elbow River cross the river in Mission permitting casual river views for passing motorists.

B2.4.3 Public Access to the River

Vehicular access close to the river exists via the cul-de-sacs abutting the riverbank and along the minor 26th Avenue. Parking is not permitted on the road bridges.

Most of the reach is in private ownership so pedestrian access exists only at isolated points and along short lengths of riverbank. The four road bridges and abandoned CNR bridge play a contrarious role, providing public access across the river, but restricing access along the riverbank.

B2.4.4 Condition of the Riverbank Area

The riverbank is generally steep but not high and covered with untended natural vegetation: primarily Balsam Poplar and tall shrub. An exception occurs opposite Lindsay Park on the outside of a river meander. There the riverbank is high, steep, largely devoid of natural vegetation and defaced by unsightly concrete rip raps.

The only significant area of riverbank parkland is the public strip of open lan by 26th Avenue S.W. This provides a natural edge to the community as it is not landscaped. The owners by the 26th Avenue bridge have landscaped the riverbanks.

B2.5 VICTORIA AND STAMPEDE PARK

B2.5.1 General Description of the Area

Victoria is the oldest community in Calgary, 80% of the buildings were constructed prior to 1914. Housing stock has deteriorated due to speculation concerning redevelopment. In 1974 a City report stated that the community " ... contained the worst physical conditions and most depressing social conditions in Calgary." (Established Communities in Calgary, 1974, Calgary Planning Department p. 68). Reclassification of part of the area in 1977 from R-5 to the lower zoning of R-3 may eventually result in a decreased population.

No designated parkland exists in the area. Victoria Park, a children oriented playground fenced off from the riverbank, separates the community from the river. A planned buffer extending along 14th Avenue S.E. between Stampede Park and Victoia may act as community open space with some orientation towards the river.

Stampede Park is a privately-operated commercial/recreational facility located on City land. Located adjacent to the river, south of 17th Avenue S.E, and east of Macleod Trail, the original 40 ha site is currently expanding north to 14th Avenue S.E., entailing destruction of eight residential blocks. The flood plain affects the horse and barns area of Stampede Park.

B2.5.2 Relationship to the River

In this area only two blocks beween 14th Avenue S.E. and MacDonald Avenue are located by the river due to expansion of both Stampede Park and industrial CPR lan.

Views of the river by Victoria residents are obstructed neither by the playground or the CPR industrial area, but by presenting a physical barrier, they prevet a close community relationship with the river. In addition, Victoria lacks planned orientation toward the river. Motorists have casual access to the river along 6th Street and 7th Street S.E.

Stampede Park is designed with the Corral, the Grandstand, and other major facilities as the focus of attention. Most of the park is bound by the river which plays a very peripheral role in park activities. A portion of land adjacent to the riverbank is landscaped and used by park employees but park patrons have little access to the river. Sheds and barns situated by the riverbank face in the opposite direction, towards the central portion of the park.

B2.5.3 Public Access to the River

A public pathway broken only by MacDonald Avenue, extends along the top of the riverbank from 14th Avenue S.E. to Fort Calgary. North of MacDonald bridge the pathway passes along a narrow vegetated strip of land with a natural appearance.

No public access is allowed along the riverbank in the Stampede Grounds. Patrons have access to a small area of landscaped park near Victoria Bridge.

B2.5.4 Condition of the Riverbank Area

The public riverbank is covered with fairly undisturbed vegetation, including Balsam Poplars and non-native grasses. Much of the Stampede Park riverbank is naturally vegetated and bordered by a narrow manicured area of parkland.

B2.6 MAYFAIR-BEL AIRE AND THE CALGARY GOLF AND COUNTRY CLUB

B2.6.1 General Description of the Area

The Glenmore Dam marks the upstream limit of the two areas and is topped by the only bridge across this part of the river.

Mayfair-Bel Aire is a modern residential neighbourhood composed of large single family dwellings and until recently separated from the river by the 4 ha Graburn Estate and a 40 m high riverine escarpment.

The 'Calgary Golf and Country Club' is a privately owned 49 ha golf course abutting the river between Mayfair-Bel Aire and 50th Avenue S.W.

B2.6.2 Relationship to the River

Recent development of the formerly private Graburn Estate has improved the communities visual and physical connection with the river and its valley. The Glenmore Dam Bridge and the dead end at 50th Avenue S.W. are other locations where the public can view the river.

Members and guests of the Country Club are fortunate in having excellent access to and good visibility of the river.

B2.6.3 Public Access to the River

Outside the golf course there is no vehicular access close to the river. 50th Avenue S.W. is the only place where motorists can park to enjoy extensive views of the river valley from the top of the escarpment.

Pedestrian access also exists at 50th Avenue S.W. and 14th Street S.W. where a safety chain link fence allows visual access only.

B2.6.4 Condition of the Riverbank Area

The very steep north-facing escarpments at Mayfair-Bel Aire and at the northern end of the golf course are covered with mixed White Spruce and Balsam Poplar. This distinctive combination of trees is not found elsewhere on the river below the Dam.

Much of the riverbank in the golf course is low and bordered by Balsam Poplar woods and the whole area has the appearance of a well-landscaped park.

B2.7 BRITTANIA

B2.7.1 General Description of the Community

Brittania is a residential community located on uplands above the escarpment and dominated by large single-family houses. Brittania Drive borders the edge of the community at the top of the escarpment, which here is lower and more gently sloping than upstream.

An area of City-owned open space, encompassing approximately 8 ha, is situated in the valley below Britannia. It is neither landscaped nor developed for formal recreational use.

B2.7.2 Relationship to the River

The Britannia community is well oriented towards the river. The roads follow the line of the river and Britannia Drive, which parallels the escarpment, neither blocks access to nor extensive views of the river. Awareness of the river is largely local however, as no major roads pass through the community close to the river.

B2.7.3 Public Access to the River

There is vehicular access to the top of the escarpment at 50th Avenue S.W. and along Britannia Drive. There is no direct vehicular access to the river from this community. Vehicular access to the parking lot in Riverdale Park is provided from Elbow Park.

A number of well used trails have developed on the escarpment facilitating pedestrian access between the community and the valley. An asphalt pathway passes through Riverdale Park, connecting with Sandy Beach via a pedestrian bridge.

B2.7.4 Condition of the Riverbank

Below the upstream portion of Britannia the escarpment slopes steeply to the river. Relatively impassible, and covered with grass and some low shrub, human disturbance is minimal.

The parkland river flats are mostly covered with non-native grasses and have been disturbed by indiscriminate use. The low riverbank is bordered by riverine forest encouraging low intensity recreational use, enhanced by the presence of parkland across the river. Native grasses and low shrub cover the slope above the parkland.

B2.8 PARKHILL-STANLEY PARK

B2.8.1 General Description of the Community

The community comprises two older single-family residential areas of disparate size - the smaller situated in the valley by the river and the larger at the top of the steep riverine escarpment. They are connected by 42nd Avenue S.W. 'Stanley Park', a City-owned family recreational facility is located in a valley separating the two communities. The lower residential area and the park lie within the floodplain.

B2.8.2 Relationship to the River

The lower residential community faces the river across a minor street and a narrow strip of parkland. The river is clearly visible but the high, steep riverbank prevents a casual relationship between community and river. In the upper residential area, houses face the valley across minor streets allowing unimpaired connection with the escarpment and good views of the river valley. Stanley Park is a landscaped major recreational park that permits both local and city-wide relationship with the river.

B2.8.3 Public Access to the River

Vehicular access to the edge of the escarpment is good but in the lower community access to the minor street by the riverbank is obscure and this area receives only local use. Stanley Park's riverbank is one of the most easily accessible sections of the Elbow River, for both motorists and pedestrians. Access exists at three locations and parking areas are available.

A formal pathway gives easy, uninterrupted access along the top of the riverbank, connecting Stanley Park to Elbow Drive and the Rideau Park - Roxboro Community. Steep trails on the escarpment connect the Parkhill area with Stanley Park.

B2.8.4 Condition of the Riverbank Area

Upstream of Stanley Park the riverbank is quite steep and covered with Balsam Poplars and tall shrubs which frequently screen the river from passers-by. Downstream of the Park, the riverbank is adjacent to the river. River erosion and various types of rip-rapping have rendered the lower part of the slope bare and unsightly. Grass and short shrub cover the upper slope of the escarpment.

The approximately 11 ha of Stanley Park are landscaped and well treed. Various facilities provide both passive and active recreational opportunities for the public. The riverbank is partially cleared and grassed, allowing contact with the river and swimming. The aesthetically pleasing appearance of this portion of the river is enhanced by the complementary presence of Edison Crescent park on the opposite riverbank.

B2.9 RIDEAU PARK - ROXBORO

B2.9.1 General Description of the Community

Subdivision of these small but well-maintained communities occurred just before the first World War with substantive growth taking place in the post second World War period. The area is dominantly composed of single family houses located in the valley by the river but a small area situated on a bluff overlooking the valley supports four high-rise apartment buildings and a group of condominium row houses. The 'CFAC' radio station and a public school are the only non-residential land uses.

Two parks are located beside the riverbank in this area: the Roxboro Park and Elbow Islands Park, the only Provincially owned park on the Elbow River.

B2.9.2 Relationship to the River

Almost the entire length of the riverbank is privately owned and occupied by residential properties so no community relatonship with the river exists. Both sides of the river and parts of the upstream and downstream stretches of this reach can be publically viewed from the mid-river vantage point of Elbow Islands Park.

B2.9.3 Public Acess to the River

A minor street parallels the line of the river but is separated from it by private residences. An informal parking area located on City land next to the river near Rideau is used only by radio station employees.

Private ownership restrcts pedestrian access to the riverbank. Isolated access exists at Roxboro Park, the Rideau open space, and at a cul-de-sac at 2nd Street S.W. Local streets connect these areas. An undeveloped potential linkage exists downstream of Roxboro Park into Erlton. Formal pathways lead along the riverbank upstream to Stanley Park and up the escarpment to Parkhill. A pedestrian bridge links Woods Park and in Elbow Islands Park a formal pathway connects the island providing access through the thick plant growth. Access to the islands is gained by means of a stairway on Mission Bridge.

B2.9.4 Condition of the Riverbank Area

The Rideau open space extends upstream toward Stanley Park and consists of a tree-lined riverbank, a grass and shrub covered escarpment, and two small shrub covered islands.

Roxboro Park is formally landscaped with manicured grass and large Balsam Poplar trees. The high, steep riverbank is covered with rip-rap overgrown by vegetation. Behind the Park the escarment is well treed, serving a natural edge to the community.

The natural vegetation on Elbow Island consists primarily of tall shrubs and Balsam Poplars.

B2.10 ERLTON

B2.10.1 General Description of the Community

Erlton is an old residential community extending from the riverbank up the riverine escarpment to uplands in the south. The construction of an L.R.T. Station on Macleod Trail may result in redevelopment and an increase in the presently small population.

The area is bound by large open spaces on three sides. To the south and east are public cemetaries and to the north, the City-owned Lindsay Park which includes a former CNR railway car storage yard. The Elbow River flows along the western, northern and north eastern sides of the area.

For the purposes of this study the light industrial area to the east of Erlon is included in this section.

B2.10.2 Relationship to the River

The community has no designated orientation toward the river. In the past, residential proprties occupied much of the riverbank, but a City-owned public right-of-way now exists behind these properties. This right-of-way, together with Lindsay Park, enables Erlton residents and the public in general to enjoy an unimpeded reltionship with the river throughout the comunity. This is of particular significance as much of the opposite riverbank is privately owned.

Moorists can view the Erlton reach of the river from the two Macleod Trail bridges and the 25th Avenue bridge.

B2.10.3 Public Access to the River

There is vehicular access to the river at the Stampede Parking area and Lindsay Park. Access is uncontrolled and the vegetation is seriously disturbed.

Pedestrian access exists along most of this reach's riverbank. However, due to the planned orientation of the community and other land uses, much of this use is informal. For example, the Macleod Trail bridges and the old CNR tracks and yard create barriers between Erlton and the riverbank whereas four bridges provide pedestrian access across the river.

The riverside 'Kismen Elbow River Park' extends downstream into Ramsay from Victoria Bridge at Macleod Trail. A small landscaped portion and parking area connected to Stampede Park by a pedestrian bridge, are used for the Indian Village during the Stampede. The rest of the park is undisturbed, excepting a formal pathway connecting Macleod Trail with MacDonald Avenue.

B2.10.4 Condition of the Riverbank Area

The riverbank is covered preominantly with Balsam Poplar and tall shrubs, which grow better on the inside of the meanders. The gentle gradients are undeveloped, allowing intimate contact with the river, while the steeper parts are often barren and rip-rapped.

Although the central portion of Lindsay Park is barren, the surrounding riverside is well treed and lacks both facilities and landscaping, presenting a natural appearance rare for an inner city area.

B2.11 RAMSAY AND INGLEWOOD

B2.11.1 General Description of the Communities

About 60% of the buildings in Ramsay and 56% of the buildings in Inglewood were constructed before 1914. The residential section of Ramsay closest to the river is situated at the top of the escarpment (called 'Scotchman's Hill') overlooking the valley. Inglewood is the only Calgary community with frontage on both the Bow and Elbow Rivers. The Elbow River's floodplain affects little of either community, but the Bow River's floodplain limits include most of Inglewood. Only the 'Kinsmen Elbow River Park' is affected by the floodplain in Ramsay. In Inglewood, Fort Calgary Park, containing two Provincially-designated historic houses, is located in the Bow River floodplain.

B2.11.2 Relationship to the River

The residents of Scotchman's Hill have extensive views of the rivers, downtown Calgary, and the Rocky Mountains. A minor street separates the residences from the escarpment edge but the steepness of the escarpment inhibits access to the riverbank.

Inglewood has no designated orientation to the Elbow River. Once, private properties backed onto the river Now this area has been purchased by the City, developed as part of Fort Calgary Park and receives predominantly non-local use.

The river is visible from the Elbow River Park though the livestock barns and itinerant workers quarters associated with the Stampede are most unsightly.

The minor streets of Salisbury Avenue and 6th Street S.E. provide vehicular access to the top of the Ramsay escarpment, permitting excellent views of the river valleys. In Inglewood, Fort Calgary Park and the two historic houses are visible from the minor 8th Street S.E. but high riverbanks obscure both the rivers.

B2.11.3 Public Access to the River

No direct public vehicular access exists. Pedestrians have continuous access along the riverbank. The formal riverside pathway extnding from Erlton continues to MacDonald Bridge where it crosss to the opposite bank. However, informal trails extend further downstream on the right bank of the river and are not impeded by the two further bridges.

B2.11.4 Condition of the Riverbank Area

Below the escarpment the riverbank is mostly low and bordered by Balsam Poplar and tall shrubs. A small strip of parkland in front of the livestock barns is the only landscaping adjacent to the riverbank.

Scotchman's Hill is steep and naturally bare in places but erosion has been accelerated by lawn watering which increases the soil's water content. At the upstream end of the reach a disturbed area exists where the CNR railway embankment impinges upon the riverbank.

Downstream of MacDonald Bridge the natural vegetation is affected solely by a trail.

B3 ENVIRONMENTAL INVENTORY

The following section is devoted to a discussion of the environmental conditions existing along the Elbow River between the Glenmore Dam Bridge and its confluence with the Bow River.

B3.1 EXISTING VEGETATION AND NATURAL HABITAT

Along the entire reach of this river between Glenmore Reservoir and its confluence with the Bow River, there are mainly three types of "green areas": established parks; natural and semi-natural areas; and disturbed areas.

B3.1.1 Established Parks

These areas are normally retained for intensive recreational uses in a city park system. Such park areas are usually created by clearing understory vegetation, preserving healthy mature trees and introducing good quality grasses and perhaps with some additional tree and shrub planting. Presently, there are approximately five established public parks, namely: Glenmore Athletic Park, Sandy Beach, River Park, Stanley Park and Lindsay Park. The existing Stampede Grounds are utilized as exhibition grounds. There is also a privately owned golf course (Golf & Country Club) located opposite to Glenmore Athletic Park and across from the Elbow River.

B3.1.2 Natural and Semi-Natural Areas

As a comparison, it should be noted that Glenmore Natural Area is the only major and significant natural area further upstream on the Elbow River. Along the Elbow River within the study area, there are only remnants of such natural habitats. However, such areas could undoubtedly form the nucleus for restoring the natural quality of the study area. There is presently a large variety of habitats and natural communites within this area which results in a diversty and abundance of wildlife. These natural areas are also distinct communities of plants, including trees, shrubs as well as ground cover.

As shown on the Environmental Inventory Map, such natural areas form parts of Sandy Beach, Stanley Park, area east of the Stampede Horse Barns, River Park, Elbow Island Park, Scotchman's Hill and Lindsay Park. In these natural areas, Balsam Poplar is the most predominant tree species. The original riverbank vegetation remains and it includes Balsam Poplar, some of which are quite large, with Red-Osier Dogwood, Aspen Poplar, White Spruce and various willows including other tall and low shrubs and native and non-native grasses. Their key concept in contrast to the established park landscaped is one of diversity. This is significant because several species of wildlife and plants occupy certain spaces in an ecosystem. All these spaces must be present to accommodate the various species and all such spaces must be filled to allow the ecosystem to function properly. To make these natural habitats viable, these areas should be sufficiently large and relatively continuous, and appropriately located in relation to one another because many animals nest in one and feed in another.

B3.1.2.1 Balsam Poplar Community

In the Elbow River Valley within the study area, there are several types of Balsam Poplar (Populous Balsamifera) forests based on the structure of the understory and the tree canopy density. Some areas have fairly dense poplar stands, while others are more open. Balsam Poplar trees are most predominant in areas such as properties immediately east of the Stampede Horse Barns (12th Avenue S.E. to 20th Avenue S.E. east of the Elbow River); Scotchman's Hill (close to the river's edge); Lindsay Park (adjacent to the river's edge); Elbow Island Park and the adjacent riverbanks; northeast part of Stanley Park; River Park and some parts of Sandy Beach. In these cases the undergrowth is mainly grasses, low and tall shrubs or combination of low and tall shrubs. The most abundant non-native grasses are awnless brome (Bromus inermis), blue grass (Poa spp.) and wheat grass (Agropyron spp.).

B3.1.2.2 Aspen Poplar (Populus tremuloides)

Along the Elbow River between Macleod Trail and its confluence with the Bow River, this habitat remains only in the belt of trees along the slopes of Scotchman's Hill intermixed with Balsam Poplar at the base of the hill. In general, trees on this slope have difficulty maintaining their position due to the slipping soil. The top of Scotchman's Hill is a typical example of upland prairie with wheat grass, needle and thread grass and Rough Fescue.

B3.1.2.3 Shrubs

In most of the habitats along the Elbow River, the main low shrub is snowberry (Symphoricarpos alba). A variety of tall shrubs common in this area, includes Dogwood (Cornus Stolonifera), Saskatoon (Amelanchier almifolia), Silverberry (Eleaegnus commutata), Water Birch (Betula accidentalis) and Willows (Salix spp.). The tall shrubs mentioned above are generally five feet or more in height. The low shrubs are Rose (Rosa spp.) and Buckbrush (Symphoricarpos accidentalis) and are normally under five feet in height.

B3.1.2.4 The River

The river itself, is notable as a habitat primarily for trout and Rocky Mountain Whitefish, which were introduced downstream from the Glenmore Dam in 1968. Rainbow trout have displaced the native Cutthroat and provide fishing potential. The river is also an important source of food and water for many land species. Therefore, the retention of bankside vegetation for shade is important to the maintenance of this habitat, especially for trout. The river itself and the vegetation along its banks are among the most positive visual features of the study area.

Other areas with similar problems are located between 4th Street S.W. and the end of Riverdale Avenue where the City walkway system cannot be implemented because of the steep slopes and also owing to the fact that the riverbank properties are privately oned.

B3.1.3 Disturbed Areas

Such areas are generally without natural vegetation and/or weeds which are fairly common to urban areas though they have no place in an urban park system. Mostly, these areas fail to reestablish themselves as natural habitats due to poor soil conditions, pollution, human activity or some other environmental problems.

Major disturbed areas adjacent to the Elbow River are as shown on the Environmental Inventory Map.

B3.2 MAJOR RECREATIONAL RESOURCE FEATURES OF THE ELBOW RIVER

B3.2.1 Fort Calgary

Historically, the confluece of the Elbow and Bow Rivers has been the most interesting area in this region in terms of use by native peoples and earlier settlements, then early explorers, traders, farmers and ranchers respectively.

In 1875, the site at the confluence was selected by the Northwest Mounted Police for what was to become Fort Calgary. During the few years after its construction, the importance of the Fort's location on the flood plain was underlined by a series of major floods. Since then, the lower part of the Elbow River was somewhat ignored. The fort site area drifted into low grade industrial uses and most of the city's growth shifted to other areas. However, there has been a renewed interest in the area with the redevelopment of the fort site. The present development on the site includes some historic buildings, interpretive centre with exhibits, kaleidoscope and picnic grounds, etc. There is also a pedestrian bridge which connects Fort Calgary to St. Patrick's Island, one of the heavily treed zoo islands. Fort Calgry is one of the major tourist attractions in the city and it also functions as a key recreational resource for the people of Calgary.

B3.2.2 Scotchman's Hill

Scotchman's Hill is a steep escarpment located on the east bank of the Elbow River west of 6th Street S.E. and opposite to the Stampede Grounds.

The escarpment is one of the most significant positive visual features along the Elbow River and it provides interesting views of itself and excellent panoramic views of the city. Along the slopes east of the horse barns, there are balsam poplar trees with abundant understory which is a combination of an interesting variety of shrubs and grasses. However, at the top of the escarpment, there are certain disturbed areas which should be reclaimed through suitable means of stabilization and planting of appropriate grasses, trees, and shrubs, etc. At the north end of Scotchman's Hill there is a small open space which is extensively used by residents of the adjacent communities as an informal play area.

B3.2.3 Elbow Island Park

The Elbow Island Park is an island owned by the City of Calgary and it is approximately located between 34th Avenue S.W. and 35th Avenue S.W. in the vicinity of 5th Street S.W. adjacent to the residential commnities of Elbow Park and Rideau Park. This island is currently considered as one of the high quality natural areas along the Elbow River and it is a key recreational resource for the surrounding residential areas.

On this island, the existing natural vegetation includes Balsam Poplars, Aspen Poplars, tall shrubs such as Dogwood Willows and also, Black Birches (Water Birches) including native and non-native grasses. Because of its natural vegetation, the island functions as a natural habitat for birds (feeding and nesting). Recreational facilities such as pedestrian trails and benches along the paths are provided. Presently, there is only pedestrian access to this island.

B3.2.4 Stanley Park

Compared with the Elbow Island Park, Stanley Park is more manicured in terms of clearing of some natural vegetative cover which has taken place. This open space is a well established park in an urban setting and it includes facilities for both active and passive recreational activities such as tennis courts, swimming pool, wading pool, walkways/bikeways, picnic areas and playfields including soccer and field hockey pitches.

The north part of Stanley Park where walkways/bikeways and picnic facilities are provided, has been retained as a semi-natural area compared to the south part which is developed and includes fully landscaped public amenities outlined above. The type of vegetative cover which exists in the north part of Stanley Park is described earlier as part of existing vegetation, and it provides for both active and passive recreational needs.

B3.2.5 River Park/Sandy Beach Area

This area is approximately 210 acres and stretches from the end of Riverdale Avenue south to the Glenmore Dam Bridge. For more detailed description, the area can perhaps be further divided into two parts. One part stretches from the end of Riverdale Avenue south to approximately 50th Avenue S.W. alignment, and it is bounded on the east by Britannia escarpment and on the west by River Park. The second part contains the area bounded on the north by 52nd Avenue S.W., on the east by the Calgary Golf & Country Club, on the south by the Glenmore Dam Bridge and on the west by Glenmore Athletic Park and the water purification plant. These two areas are separated by a small privately owned land (Harvie Foundation) in the river valley. Part one, as outlined above is owned and controlled by the City Parks/Recreation Department.

The River Park area is a formalized park located on the western upland of the Elbow River. Recreational facilities such as hiking trails and picnicking are provided in areas with natural vegetative cover of Balsam and Aspen Poplars, White Spruce and upland prairie grasses.

Compared to the formal River Park, Sand Beach Area is a composite of natural communities with Grasslands as the continuous peripheral community. The most distinct community is the Riverine Forest which comtains predominantly Balsam Poplars. There are also Coniferous Forest, Aspen and Aquatic communities existing in this area. Consequently, there are numerous disturbed sites in the Sandy Beach Area, as shown on the Environmental Inventory Map.

B3.2.5.1 Riverine Forest:

Balsam Poplar, a large, fast growing and moisture-loving tree, is the dominant species along the Elbow River flood plains. In the wetter areas bordering the river are the Willows and Water Birch. In the mature woods the Red Osier Dogwood forms the dense underbrush. Some Chokecherry, Saskatoon berry and Manitoba Maple are also found. In spite of the fact that it is quite shady in summer, adequate sunlight penetrates the poplar canopy and together with the good moisture conditions, provide a suitable habitat for Twining Honeysuckle, Canada Anemone, various types of Buttercups, common Horsetail and White Geranium.

It should be noted that much of the Riverine Forest (flood plain areas) undergrowth has been cleared to provide recreational uses such as trails and picnic areas.

B3.2.5.2 Aspen Forest:

The Aspen Forest community mixes with the upland grasslands and merges with the riverine forests in the flood plains which forms a mature and healthy growth of Aspen Poplars along some parts of the west bank. On the periphery of these Aspen woods are larger shrubs like Saskatoon berry and Chokecherry and the smaller Spreading Dogbane and common Wild Rose. The shrub layer in the Aspen Forest is well developed and several plant species grow well under the lightly shaded conditions of the Aspen woods. Some of the common flowering plants which grow in the area, are Star-flowered Solomon's Seal, Western Canada Violet, Mackenzie's Hedysarum, Wild Snowberry, Baneberry and Bluebell. Many areas have been disturbed, and introduced plant species such as Pineapple Weed, Western Blue-bur, Davie's Rocket and clovers thrive well.

B3.2.5.3 Grasslands:

This refers to the upper dry slopes of the Sandy Beach Area on both sides of the Elbow River, and such areas are generally characterized by the Grassland community. These very open and conveniently accessible areas lie exposed not only to the direct sunlight and drying winds but also the brunt of human disturbance.

The main types of grasses are Crested Wheat Grass and introduced species like Awnless Brome, Kentucky Bluegrass and Timothy. A wide variety of flowering plants are found starting in the early spring with Prairie Crocus, followed by Three-Flowered Avens, Bluebells, Prairie Onion and Nodding Onion in the summer and asters and goldenrods in the fall. Other grasses like Northern Bedstraw, Wild Bergamot, the sweet clover and Sweet Grass certainly add to the pleasant and distinctive aroma of the Grassland community.

In the disturbed areas, plants such as Shrubby Cinquefoil, Western Snowberry, Baby's Breath, Leafy Spruge, Butter and Eggs, and some locoweeds are commonly found.

B3.2.5.4 Coniferous Forest:

On the steeper parts of the east bank of the Elbow River can be found White Spruce which dominates the Coniferous Forest community. Under the cool, most north-facing conditions the White Spruce has grown to maturity and the dense stands support a limited understory growth. Plants normally found in the Coniferous Forest communities are Common Pink Wintergreen, Bracted Orchid and Fairy Bells. Since the areas are parts of steep slopes, accss is difficult and therefore, the Coniferous Forest communities are relatively undisturbed.

B3.2.5.5 Aquatic Community:

The isolated lagoons located in the ever-changing gravel bars of the Elbow River provide suitable habitat for Willows, water sedge, water foxtail, Wild Mint, Hedge Nettle and other species which are able to adjust readily according to changing water levels like Arrow-leaved Colt's foot. Also there is a wide variety of submerged aquatic plants about which no detailed information is available.

B3.2.5.6 Bird Species:

The species of birds that have been seen in the Sandy Beach Area are as follows: Grebes, Herones, Waterfowl, Raptors, Pheasant, Partridge, Shorebirds, Gulls, Doves, Owls, Woodpeckers, Flycatchers, Larks, Swallows, Jays, Magpies, Crows, Chickadees, Nuthatches, Wrens, Mockingbrids, Thrashers, Thrushes, Kinglets, Pipits, Waxwings, Shrikes, Viroes, Warblers, Meadowlarks, Blackbirds, Orioles, Grosbeaks, Finches, Sparrows, Juncos, Longspurs, and Buntings. Any further detailed information regarding these bird species can be obtained from the Calgary Field Naturalists' Society.

B3.2.5.7 Mammals:

The mammals which are normally found in this area are: Eastern Grey Squirrel, Richardson's Ground Squirrel, White-tailed Prairie Hare, American Varying Hare, White-tailed Deer, Coyotes, Mink, Muskrat and Beavers.

The White-tailed Deer has been occasionally seen on the slopes below Britannia in mid-winter. In the Sandy Beach Area of the Elbow River there are no beaver dams but there are dens on the riverbank with evidence of wood debris near the entrance to dens. However, beavers can be seen towing tree branches and there are many fresh cuts in the aspen poplar and willow growing along the banks of the Elbow River.

A small population of beavers within this section of the City may be of educational value. However, it is stressed that a large population could cause extensive damage to trees and shrubs.

B3.2.5.8 Fish, Amphibians and Reptiles:

Between early spring and late summer, fishing is a very popular leisure time activity along the riverbank. Generally, the catch includes Rocky Mountain Whitefish, Rainbow Trout and White Sucker. Innumerable small minnows can be seen in shalow water, particularly when the water level is rather low in late summer

Chorus Frogs are generally found in the drainage ditches and the larger Leopard Frog has been seen along the riverbank. Although the common garter snake has not been seen or reported, the less common Wandering Garter snake has been seen in the vicinity of Britannia Drive.

B3.3 CULTURAL FEATURES - ELBOW RIVER

The main cultural features along the Elbow River are Electric Transformer Station, Parks (developed and semi-developed), Golf Courses - Calgary Golf and Country Club (private facility), Hospital, Cemetery, Exhibition/Amusement Grounds and Fort Calgary.

B3.3.1 General Storage

Stampede Park land which is currently leased by the City of Calgary to the Calgary Stampede Association for mainly exhibitions has a strong influence upon its immediate adjacent development. It appears that the Stampede Park Association has, to the present time, failed to take proper advantage of its attractive riverbank frontage. Adjacent to the river, the main facilities are storage and service yards which have a negative impact on the surrounding river valley open spaces. Storage yards generally reflect the appearance of ignored industrial development. These yards are unsightly and odorous large barren areas with ghastly utilitarian structures, abandoned trucks and other scrap. As a result of these situations the value of open spaces in the adjacent river valley will never be fully appreciated by the general public.

B3.3.2 Transportation Corridors

Concerning transportation rights-of-way existing adjacent to the Elbow River corridor, it should be noted that certain major roads undesirably impinge upon the river park system especially at 1st Street S.E., 6th Street S.E., and 26th Avenue S.E. in the vicinity of Lindsay Park, Elbow Drive between 4th Street S.W. and 9th Avenue S.W., and 6th Avenue S.W. between 4th Street and 1st Street S.W. In addition, other such roadways are planned to cross the park system particularly in the easterly portion of Lindsay Park, e.g. Macleod Trail and 26th Avenue S.E. Connector.

B3.3.3 Industrial

In reference to the existing light industrial uses adjacent to the Elbow River, it is noted that such uses are prevalent to the southwest and southeast of Sampede Grounds, and directly south of the CPR line and east of the Elbow Rver. Furthermore there is a city water purification plant and an electric transformer station located in the southern parts of Glenmore Athletic Park. The electric transformer station is undesirably located and it is very unpleasant aesthetically. The Sunbeam Bread Factory located directly west of 6th Street S.E. and a service station by the CPR line come rather close to the Elbow River. At this locaion there are some mobile homes stored and a few of these are partially overhanging the adjacent riverbank.

B3.3.4 Residential

Respecting the existing residential development adjacent to the Elbow River, it mus be emphasized that this development comes quite close to the river and therefore in almost all cases, it is entirely within the flood plin limits based on a designated flood of 20,300 c.f.s. with a return period of one in 100 years. Majority of the riverbank/escarpment lands with existing residential development backing on to the river are privately owned.

C NOSE CREEK

C1 LAND USE INVENTORY

C1.1 Ownership and Land Use Overview

Land ownership adjacent to Nose Creek consists of Crown Land, Farming Land and Development and Industrial Corporation Land. In the southern half of Section 15 N which is the area of Crown Land, the CPR and Deerfoot Trail block access to the creek. Thus, apart from where road allowances cross the creek there is no legal public access to or along the creek in the entire study area.

With the exception of the land utilized for rights-of-way and industrial operations all lands are in agricultural uses.

C1.2 Rights-of-Way

The CPR right-of-way parallels the direction of the creek at a distance ranging from 15 m (50 ft.) to 425 m (1,400 ft.). For the most part it is situated at the base of the western escarpment. The Deerfoot Trail (Highway 2) parallels the course of the stream to the 96th Street N.E. alignment where it crosses the eastern escarpment and moves away from the creek in a northeasterly direction. In the southern half of Section 15 N both the CPR and Deerfoot rights-of-way are situated at the base of the two escarpments on either side of the creek. The creek is constricted to an artificial channel bed course about 45 m (150 ft.) wide between the two rights-of-way. Evidence of the former course of the creek exists in the form of artifically created oxbow lakes isolated from the new course of the creek on either side of the rights-of-way. In this area one of the Calgary International Airport's runways terminates near the top of the eastern escarpment to the east of Deerfoot Trail. A large area at the end of the runway extending to the edge of the escarpment has been disturbed.

Nose Creek is crossed by two roads in the study area, the Beddington-Delacour Road (112th Avenue N.E.) and just south of the City limits, 15th Street N.E.

The Beddington Expressway will cross the CPR tracks and the creek to join Deerfoot Trail just north of the 80th Avenue N.E. alignment.

C1.3 Farmhouses

There are four farmhouses located within 600 m (2,000 ft.) of Nose Creek. They are located as follows:

- on the west side of the creek at the top of the escarpment, to the west of the CPR tracks, immediately adjacent to 112th Avenue N.E.;
- on the east side of the creek to the west of 15th Street N.E. in the centre of Section 26 N;

two are located to the east of 15th Street N.E. in the northeast quarter of Section 25 N.

Additionally there is a farm in the southeast quarter of Section 25 N adjacent to 15th Street N.E. about 910 m (3,000 ft.) from the creek. There are two farmhouses close to the creek immediately outside the City limits. One is located at the top of the western escarpment to the west of the CPR tracks about 300 m (1,000 ft.) from the creek. The other is located immediately adjacent to the left bank of the creek on the outside of a meander.

C1.4 Industrial Operations

There are three areas of discontinued gravel operations to the east of Nose Creek in Section 26 N. The extracted topsoil has been piled into two mounds, the largest is about 210 m (700 ft.) long and 120 m (400 ft.) wide and forms a sizeable hillock.

There is an area of active gravel extraction in the northwest corner of Section 23 N at the top of the escarpment to the west of the CPR tracks. At its closest point this area is about 365 m (1,200 ft.) from the creek. To the south southwest of this area at the present southern end of 6th Street N.E. is a privately operated crushed glass disposal site. Immediately south of this area on the boundary between Sections 22 and 23 N and extending south into the extreme northeast portions of Sections 14 and 15 N respectively is a large area of gravel extraction operated by Gallelli Construction.

C1.5 Utilities

There are four oil well sites in this area, one each in Section 14 and 23 N and two in Section 26 N. One of these latter two in the northeast quarter of Section 26 N is located within 300 m (1,000 ft.) of the creek, to the west of the CPR tracks and the escarpment. There is a fifth oil well site located just outside the City limits in the southwest quarter of Section 35 N.

There are two gas lines in this area. One runs in a northwesterly direction crossing the creek just south of the 128th Avenue alignment. The other crosses the creek about 275 m (900 ft.) north of the confluence of Nose and Beddington Creeks.

An electric power line parallels 112th Street N.E. crossing the creek north of the 112th Street N.E. bridge.

To the north of the City limits is the approximately 1.6 km wide (1 mile)- 'Utility Corridor' which was proposed by the Province.

C2 ENVIRONMENTAL INVENTORY

C2.1 General Overview

Nose Creek is a major stream in the northern part of the city which is fed by intermittent streams and Beddington Creek. It has a small drainage basin of about 480 square kms (185 square miles). The dominant geological characteristic of the area is the presence of extensive gravel deposits overlain by unconsolidated glacial material called till.

The escarpment bluffs are the dominant physical feature of the area. They were probably formed by meltwaters in the post-glacial period. The escarpments vary in height from about 10 m (35 ft.) to about 45 m (150 ft.) gradually converging towards the southern end of the study area. The stream meanders between the two bluffs in a valley floor up to 670 m (2,200 ft.) wide. At the southern end of the area the valley floor is less than 300 m (1,000 ft.) wide.

The stream meanders in the valley bottom between the bluffs apart from in the extreme southern portion of the area where its course is artificially channelized.

There is both grazing and arable land in the valley. The escarpments are in a largely natural state whilst the land at the top of the slope is in arable, grazing and industrial use.

The area contains no outstanding visual characteristics. Its greatest present asset is the impression of openness characteristic of prairie farmland. The short, moderately steep escarpments add interest to the area. From the top of the escarpments the dominant visual features are the airport to the southeast, the city skyline south and Nose Hill to the southwest.

C2.2 Archaeology

Historically, the Plains Indian Culture flourished on the high plains of Alberta and the Peigan tribe of the Blackfoot Indians were established in this area prior to the coming of the white man.

This area of Nose Creek contains the densest concentration of archaeological sites to be found within the city. According to information supplied by the Archaeological Survey Branch of the Alberta Culture Department there are sixteen sites of archaeological significance which require further study located adjacent to Nose Creek within the study area. The sites are concentrated in the northern portion of the area.

Before any development takes place within this general area, landowners/ developers affected are required to consult the Archaeological Survey Branch.

C2.3 Habitats

Due to its aspect the escarpment to the west of the creek carries a slightly greater diversity of flora than its counterpart. There are very few trees in the area - occasional small Balsam Poplars survive on the immediate creek bank. A notable exception is a good stand of Balsam Poplar adjacent to one of Gallelli Construction's abandoned gravel pits in the extreme southwest portion of Section 22 N about 670 m (2,200 ft.) to the west of the creek. The understorey is predominantly Canada Buffalo Berry and there are a number of flowering plants such as the Yellow Pea Vine, American Vetch and Canada Anemone.

In the valley itself the dominant vegetation is various prairie grasses and numerous flowering plants and shrubs. The shrubs occur primarily adjacent to the creek and the railway embankment and on the escarpments. They include Saskatoon Berry, Wolf Willow, Shrubby Cinquefoil, willows and Western Snowberry. Some of the flowering plants identified in the area are the Fairy Candelabra, Pussytoes, Golden Aster, Golden Red, Woolly Gramwell, Mackenzie's Hedysarum and the Yellow Umbrella Plant.

There are Horned Larks in the area and Prairie Falcons can frequently be observed hunting small mammals such as the Meadow Vole and prolific Richardson's Ground Squirrel. Other mammals observed in the area are the Long-tailed Prairie Weasel, American Varying Hare and Coyote. There are numerous Badger sets adjacent to the CPR embankment. There is some evidence of Beaver activity.

C2.4 The Creek

Nose Creek is yellowy green in colour, it has a slight odour and it is difficult to see the stream bed where it is more than several inches deep. Agricultural runoff is primarily responsible for the pollution. It is of two main sources. Firstly from artificial fertilizer nutrients such as phosphates and nitrates which are utilized on arable land and secondly from the faeces of grazing animals. The creek is also affected by a storm sewer which outlets at the head of a small ravine which runs in a northwesterly direction from the Deerfoot Trail for about 245 m (800 ft.) joining the creek in the south central portion of Section 23 N.

In many places the stream presents a neglected appearance. It is crossed by numerous old barbed wire fences where the wire hangs rusting in the water, collecting various grasses, pieces of wood and assorted junk which affects the flow of the creek and hinders the movement of aquatic life. The supporting structure of the wood and concrete bridge at 112th Avenue N.E. has ponded back the creek for about 1,500 m (5,000 ft.) in Section 26 N. Immediately north of the bridge the creek is over 10 m (30 ft.) wide and the speed of flow is extremely sluggish.

Despite the deleterious effects of man the creek retains some significance for its geomorphological features and the habitat which it provides. There are some well developed wide meanders and in a couple of places, notably in the central portion of Section 23 N, the outside of a meander co-incides with the base of the escarpment resulting in a 'flattening' of the feature and active erosion of the escarpment base. In a number of places the stream has migrated leaving evidence of former stream channels and oxbow lakes. The best examples are immediately south of the 96th Avenue N.E. alignment adjacent to the Deerfoot Trail and north of the 128th Avenue alignment extending out of the City limits where the stream pursues a particularly convoluted course and there are numerous former channels superimposed upon one another.

Although polluted, the creek is still an important watering area for both birds and mammals. Canada Geese and Mallards are frequently observed on the creek. At the confluence with Beddington Creek there are a number of large slabs of rock covered with lichens and although channelized, the area adjacent to the ill-defined stream bed supports numerous grasses, rushes, weeds and shrub - notably Sandbar Willow.

There is a sizeable slough located immediately adjacent to 128th Avenue N.E. at the top of the escarpment just over 300 m (1,000 ft.) from the creek. It is about 395 m (1,300 ft.) long and 60 m (200 ft.) wide. A tiny intermittent creek referred to locally as "Gravel" creek joins Nose Creek at approximately the 96th Avenue N.E. alignment. It passes to the north of the Balsam Poplar grove between the Gallelli Construction site and the crushed glass depot. In many places the only evidence of its existence are boggy depressions. It is nevertheless an important source of water for the wildlife of the prairie and a diverse number of flowering plants flourish in its immeidate vicinity.

C2.5 The Glacial Erratic

The most notable feature of the Nose Creek Valley is a large glacial erratic located between the railway and the creek in the central part of Section 26 N. It was deposited when the ice melted at the end of the last glacial period and forms part of the Foothills Erratic Trail - the most notable member of which in the Calgary region is the Okotoks 'Big Rock'. In this study area there are two other notable erratics - Split Rock which is described in the Beddington Creek Section and a large erratic located close to 4th Street N.W. in the northwest corner of Section 22 N. All are composed of quartzite and have been rubbed smooth by the rubbing action of buffalo. The animals' hooves have created deep depressions around the rocks.

The Nose Creek erratic has an estimated weight of about 246 tonnes (250 tons). Its south face is defaced by a slogan.

C2.6 Disturbed Areas

There are three major types of disturbed areas adjacent to Nose Creek. These are disturbance caused by gravel extraction operations, the disturbed area in the 'safety zone' at the end of the airport runway and the channelization of Nose Creek in the southern part of the area. All are described in the Land Use Inventory.

D WEST NOSE (BEDDINGTON CREEK)

D1 LAND USE INVENTORY

Note: In June 1976 the Canadian Permanent Committee on Georgraphical Names Decisions adopted West Nose Creek as the official name of the creek commonly referred to as Beddington Creek (14-25-1-W5). The name Beddington Creek was given to a very small creek which outlets into Nose Creek approximately 1.2 km (.75 mile) north of the new West Nose Creek (23-25-1-W5).

D1.1 Ownership and Land Use Overview

The vast majority of the land in the vicinity of West Nose Creek is owned by Development Corporations. There is some land held by farmers, Industrial Corporations and miscellaneous individuals. Consequently apart from where road allowances cross the creek there is no legal public access to or along the creek in the entire study area.

With the exception of land utilized for roads, industrial operations and residential development, all lands are in farmland uses.

D1.2 Rights-of-Way

There are a number of roads in the vicinity of West Nose Creek. The Simon's Valley Road runs in a northwesterly direction, paralleling the direction of the creek at a distance of between 300 m (1,000 ft.) and 850 m (2,800 ft.). The lesser distance is to the east where the road terminates at 4th Street N.W. becoming Simon's Valley Drive. 4th Street N.W. is the only major road bridging the creek in the study area. Minor farm access bridges cross the creek west of 4th Street N.W. and in the extreme N.W. portion of the study area near the City limits. 6th Street N.E. fords the creek adjacent to the CPR tracks and continues as a track to the Gallelli gravel extraction site described in the Nose Creek Inventory. Immediately east of the CPR bridge the creek joins Nose Creek.

112th Avenue N.W. extends as far as the top of the escarpment in the southwest quarter of Section 28 N before continuing to the north. It's westward extension on the opposite side of the creek acts as a farm access road and joins Simon's Valley Drive outside the City limits.

The proposed Beddington Expressway will connect with the Deerfoot Trail just north of the 80th Avenue N.E. alignment. The expressway will parallel the top of the escarpment on the south side of West Nose Creek crossing 4th Street N.W. then Simon's Valley Road in the southeast quarter of Section 20 N. It is eventually to connect with the proposed extensions of John Laurie Boulevard, Shaganappi Trail and Sarcee Trail.

D1.3 Farmhouses

There are six farms located within 455 m (1,400 ft.) of West Nose Creek. They are located as follows:

- to the south of Simon's Valley Road in the north central portion of Section 16 N about 430 m (1,400 ft.) from the creek;
- immediately adjacent to the left bank of the creek to the west of 4th Street N.W. in the southeast quarter of Section 21 N;

- immediately adjacent to the left bank of the creek by the City limits in the southeast quarter of Section 29 N;
- south of the creek in the southwest quarter of Section 21 N about 120 m (400 ft.) from the creek;
- south of the creek in the east central portion of Section 20 N about 355 m (1,100 ft.) from the creek;
- south of the creek by the City limits in the northeast quarter of Section 20 N about 60 m (200 ft.) from the creek.

D1.4 Industrial Operations

There are two areas of gravel extraction located to the north of West Nose Creek beyond the escarpment. One is located adjacent to 4th Street N.W. and contains a processing plant. The other is located by the 6th Street N.E. alignment and is described in the Nose Creek Land Use Inventory. Both are operated by Gallelli Construction and extend to within 425 m (1,400 ft.) of the creek.

There is a linear area of gravel extraction on the escarpment to the north of the creek west of 4th Street N.W. It is about 1,000 m (3,300 ft.) long and extends to within 30 m (100 ft.) of the creek.

There are abandoned gravel extraction operations to the east and west of 4th Street N.W. abutting the escarpment. Further disturbance is being created in these areas by construction of residential development.

D1.5 Residential

There are substantial areas of residential development in the southern halves of Sections 15 and 16 N to the south of the creek. The area to the west of 4th Street N.W. is presently the most extensive. It is being developed for single family housing by Stellar Enterprises and extends to the junction of Simon's Valley Road and 4th Street N.W. about 275 m (900 ft.) from the creek.

To the east of 4th Street N.W. Prairielands Development Ltd. are constructing a townhouse subdivision which extends to the Beddington Expressway alignment about 120 m (400 ft.) from the creek.

There are two country residential properties located within 210 m (710 ft.) of the creek adjacent to the City boundaries in the southeast portion of Section 29 N.

D1.6 Commercial

The Circle 8 Speedway is located beyond the top of the south-facing escarpment in the northeast quarter of Section 15 N about 105 m (350 ft.) from the creek. It has an access road leading to 4th Street N.W.

'Demolition Derbys' are held at the Speedway which receives predominantly weekend use.

D1.7 Utilities

An electric power line crosses the creek at the 112th Avenue N.W. alignment. A gas pipeline follows the 6th Street N.E. alignment. About 800 ft. north of the confluence of Nose and West Nose Creeks it changes direction to the west, crossing the creek a number of times and passing through the Simon's Valley Road and 4th Street N.W. interchange.

A storm sewer serves the Stellar Enterprises residential development, outletting into the creek in the south central portion of Section 21 N.

D2 ENVIRONMENTAL INVENTORY

D2.1 General Overview

West Nose Creek is a small stream located in the northwestern part of the city. It has a small drainage basin of about 308 square kilometres (119 square miles). Geologically, tertiary sandstones are dominant, being capped by gravel beds which are covered with a layer of till of varying thickness.

The physical characteristics of the West Nose Creek valley exhibit a greater diversity than those of the Nose Creek Valley. The valley bottom varies in width from about 76 m (250 ft.) to 730 m (2,400 ft.) wide and the escarpment bluffs from effectively non-existent to well-defined and varying in height from about 12 m (40 ft.) to 60 m (200 ft.). East of 4th Street N.W. the escarpments are well defined with the north facing escarpment being the higher and steeper of the two. West of 4th Street N.W. the position is reversed - the north-facing escarpment merges into a gently rising moorland which is incised by a number of small ravines which run in a northeasterly direction to join the creek. The south-facing escarpment increases in height and definition towards the west - elevation reaches a high point at about the city limits.

West of 4th Street N.W. the stream follows a meandering course at the base of the south-facing escarpment. East of 4th Street N.W. the stream meanders between the base of the two bluffs.

The valley bottom is predominantly in arable and grazing use. With the exception of an area of gravel extraction west of 4th Street N.W., the escarpments are in a largely natural state. Land at the top of the slope is in arable, grazing, industrial, residential and construction uses.

The valley itself is of visual interest east of 4th Street N.W. There are no outstanding views in this area as the natural vantage point - the edge of the south-facing escarpment, is overlooked by the north facing escarpment thereby creating an area of dead ground which includes the city skyline. West of 4th Street N.W. the steep south-facing escarpment is the dominant visual centrepiece. From the top of this escarpment, north of 112th Avenue N.W. by the City limits, there are excellent views to the west, south and east.

D2.2 Archaeology

According to the Archaeological Survey Branch there are six archaeological sites in this area which require further study. Prior to any development in the area, landowners/developers affected are required to consult the aforementioned Branch.

Refer to the corresponding section of the Nose Creek Environmental Inventory for additional information.

D2.3 Habitats

In terms of habitat and other characteristics, Beddington Creek falls into two distinct areas which are discussed separately as follows:

D2.3.1 West of 4th Street N.W.

Only the south-facing escarpment and floodplain area are not in farmland use. Numerous flowering plants have been identified in this area including the Golden Bean, Early Blue Violet, Yellow Prairie Violet, Alum Root, Prairie Townsendia, Bladderpod, Hedysarum, Yellow Flax, Incised Puccoon, Grand Plum, Heart-leaved Buttercup, Prairie Orange and Prairie Crocus. The Cushion Milk Vetch grows on the sandstone outcrops of an old quarry located in the central portion of this area. It has been dubbed the '1891 Quarry' after in inscription found on one of the rocks. In the quarry there is some Chokecherry, Wolfwillow and a grove of Aspen which is interspersed with a few Balsam Poplars. There is a similarly composed linear grove situated about 90 m (300 ft.) from the watercourse on the opposite side of the creek.

Some birds observed in this area of the creek are the Killdeer, Mallard, Merlin, Solitaire, Fays Phoebe, Common Snipe, Ring-billed Gull, Great Blue Heron, Swainson's Haw, and Marsh Hawk. On rare occasions the Belted Kingfisher has also been observed. Red-tailed Hawks nest in the area as did the Prairie Falcon which is no longer seen.

Mammals identified include the Meadow Vole, Richardson's Ground Squirrel, White-tailed Prairie Hare, Coyote and Mule Deer. Both the common and Red-sided Garter snakes are frequently observed in the area.

The two outstanding features of the area are identified as follows:

D2.3.1.1 The south-facing escarpment is inhabited by the prairie fescue community and is the home of most of the flowering plants listed above. In vertical elevation from the watercourse it is the highest escarpment in either the Nose or Beddington Creek areas. It is incised by a number of gulleys - notably to the west of the old sandstone quarry. In the northwest of the area it has a distinctive arc shape which extends out of the City limits. The commanding views from the top of the escarpment at this point are the best in the area. To the northwest of the old quarry it is in a natural state, disturbed only at one point by a dirt farm access road connecting with 112th Avenue N.W.

D2.3.1.2 West Nose Creek is notable primarily for its high meander ratio caused by numerous small meanders. Between the City limits and 4th Street N.W. the creek travels about 5.8 km (3.6 miles). The direct distance is just over 3.2 km (2 miles). The course of the stream is extremely tortuous and evidence of former stream channels are found everwhere, providing a text book example of lowland stream fluvial geomorphology.

D2.3.2 East of 4th Street N.W.

There are three main areas of existing habitats. They are descirbed as follows:

D2.3.2.1 The Prairie at the top of the escarpment on the north side of the valley. Flowering plants include the Prairie Crocus, Moss Phlox, Early Blue Violet, Brown-eyed Susan, Wolly Gromwell, Pale Camandra, and Shrubby Cinquefoil. The Western Meadowlark, Killdeer, and Claycoloured and Vesper Sparrows are often seen here. Richardon's Ground Squirrels are very prolific and both Coyotes and White-tailed Prairie Hares have been observed.

D2.3.2.2 The Escarpments - the south-facing escarpment is lower and less steep than it's counterpart and is largely covered with the prairie fescue community described above. Sand Wasps and Cliff Sparrows nest in the sandstone cliffs. There are a number of old badger sets.

The north-facing slopes are covered with such shrub as the Western Snowberry, Saskatoon-berry, Wild Gooseberry, Red Osier Dogwood, Common Wild Rose and various willows. There are scattered Aspen. Flowering plants include the Canada Anemone, Sticky Purple Geranium, Star-flowered Solomon's Seal, Brachted Orchid and Fireweed. There are a number of springs in the escarpment where mosses and Water Birch grow. Birds seen here include the Catbird, Eastern Kingbird, Clay-coloured Sparrow and Brewer's Blackbird. The Mourning Cloak Butterfly has been noted here. Mule Deer and the American Varying Hare occasionally pass through this area.

The shrub covered north-facing slope is the most outstanding feature of interest in this area. It is a distinctive habitat atypical of anything found elsewhere along the two creeks. It's significance has been drastically reduced by considerable manmade disturbance. This is discussed under 'Disturbed Areas'.

D2.3.2.3 The Floodplain - Western Snowberry and Wolf Willow grow on the slightly higher areas of land near the watercourse. Flowering plants include the Wild Mint, Northern Bedstraw, Celery-leaved Buttercup and various Asters. Mallards, Soras, Magpies and Gray Partridges have been seen here. The number of mammals occurring in this area have rapidly declined with the increasing influence of man. Oral tales tell of Buffalo, Lynx, Bear and Wolves in this area. Until recently there were good populations of muskrat and beaver in the area - the Calgary Field Naturalists Society noted a number of beaver and 12 dams in 1973 but there is no evidence of their presence now.

D2.4 The Creek

The significance of the stream meanders are discussed in the preceding section. East of 4th Street N.W. the meanders continue and the loops become rather wider. Isolated willows grow in the low lying areas adjacent to the watercourse throughout the whole area.

The basic characteristics of the creek with respect to pollution and importance as a watering area are entirely similar to these described for Nose Creek. The area to the east of 4th Street N.W. is more disturbed than any other area adjacent to either of the creeks and is discussed under 'Disturbed Areas'.

D2.5 The Glacial Erratic

The erratic known as Split Rock is situated on a rocky bluff overlooking Beddington Creek south of the Circle Eight Speedway.

Originally weighing an estimated 112 t (110 tons) it subsequently split along bedding planes into two main parts and a number of smaller rocks. As a result it is a particularly interesting landmark. It's origins and history are entirely similar to those of the Nose Creek erratic and referral should be made to that section.

Split Rock is described further in the ensuing section.

D2.6 Disturbed Areas

The most spatially extensive disturbed areas are the result of past and present gravel extraction operations, road and residential construction operations. The sites most affecting the creek environs are located in a linear strip on the south-facing escarpment west of 4th Street N.W., either side of 4th Street N.W. where it crosses the creek; adjacent to the creek and at the top of the slope west, and immediately adjacent to 4th Street N.W. and along the top of the north-facing escarpment east of 4th Street N.W.

Unfortunately other forms of disturbance have locally affected much of the creek valley and the only outstanding area remaining in a natural state is the creek and the escarpment to the northwest of the '1891' sandstone quarry.

Despite the natural qualities of the remainder of the area and the variety of habitats that it supports the overall impression is presently one of critical neglect and abuse. Sadly, the most outstanding features have suffered most. Split Rock is defaced by numerous printed slogans and is completely surrounded by broken bottles, beer caps and soft drink cans. The north-facing slope opposite the rock is badly scarred by numerous four wheel drive and dirt bike trails. In many areas the vegetation is completely stripped, erosion is severe and the creek bed is traversed by vehicle tracks. The floodplain is littered with empty drums and tires.

The top of the escarpment, escarpment face and the inside of a meander at the Bedford Place alignment have been particularly disturbed by vehicular activity.

Immediately west of the CPR bridge the creek has been forded in two separate places by the 6th Street N.E. alignment and the creek banks have been destroyed. There is an informal dump in this area containing a variety of rubbish ranging from discarded wooden boxes to a rusting box spring bed and mattress. A number of old cars have been pushed down the escarpment at this point. One lies partially submerged in the creek. There is a lot of broken glass and numerous discarded rifle cartridges. There is a line of concrete pipes in the stream. The stream is virtually opaque and is malodorous.

E WATER USE: QUALITY, FLOW LEVELS AND DIVERSIONS

E1 WATER QUALITY

E1.1 OVERVIEW

The following data related to the existing sources and types of pollutants, recent and past quality of water and potential sources of pollution has been provided by the Water Pollution Control Division of the Alberta Department of the Environment (December 1978).

The Alberta Department of the Environment strives to control stream pollution by formulating the most stringent controls for waste water discharges that are practicable and by monitoring the quality and quantity of such discharges to ensure that license requirements are being met. The Standards and Approvals Division sets the limits of pollutant discharge based on a knowledge of the process which results in wastewater being produced. Their limits constitute part of the terms and conditions of a license which is reviewed from time to time, thus ensuring that new treatment technology can be implemented where it is practicable. The Pollution Control Division on the other hand conducts a systematic surveillance of actual wastewater discharge quality. This program, together with review of monthly reports and analyses received from the licensed individuals, provides the base of information from which license violations and general problems are detected. These two Divisions of the Environment Department are part of the Environmental Protection Service and they operate under the authority of the Clean Water Act in matters regarding water quality.

Two methods of monitoring of surface waters have been used by the Water Quality Control Branch. A number of stations have been established from which grab water samples are analyzed chemically at regular intervals. This sampling, together with two automatic water quality monitors forms a chemical network for water quality data collection. Analyses from grab samples include major anious and catious, nutrients, heavy metals, pesticides, bacteriological constituents, PH, dissolved oxygen, oil and grease, phenols, biochemical oxygen demand, odour, surfactants, turbidity, dissolved solids, and suspended solids. Automatic monitors have the capability to continuously record dissolved oxygen, PH, conductivity, temperature and turbidity. As other reliable sensors become available they will be considered for installation.

To complement this network, a biological water quality programme was established in 1973. Twice yearly sampling and analysis of benthic invertebrate community structure has given an indication of the type of change in the Bow River as a result of wastewater, and the longitudinal extent of such change.

E1.2 THE BOW RIVER

E1.2.1 Existing Sources and Types of Pollutants

For the Bow River, the primary problem is the addition of organic wastes. The changes observed in biological communities are typical of organic pollution, while the chemical parameters which most often exceed the criteria below Calgary are the nutrients.

The following are sources of continuous discharge of wastwater to the Bow River, and the loadings of important wastewater constituents according to 1977 figures:

Cominco (fertilizer manufacturer)

- ammonia nitrogen - 154.2 kg/day
- nitrate nitrogen - 36.4 kg/day
- organic nitrogen - 2.7 kg/day
- total suspended solids - 38.7 kg/day
- chemical oxygen demand - 819.9 kg/day

Gulf Oil (oil refining)

- oil and grease - 29.1 kg/day
- suspended solids 28.2 kg/day
- phenols - 0.043 kg/day
- sulphide - 0.13 kg/day
- ammonia nitrogen - 2.06 kg/day
- chemical oxygen demand - 115.9 kg/day

Bonnybrook Sewage Treatment Plant (secondary treatment)

- phosphate - 2,283 kg/day
- suspended solids - 2,896 kg/day
- biochemical oxygen demand - 2,892 kg/day

Fish Creek Sewage Treatment Plant (primary treatment)

- phosphate - 795 kg/day
- suspended solids - 4,169 kg/day
- biological oxygen demand - 5,794 kg/day

In addition, there is one intermittent discharge from a settling basin at the Burnco sresults in a loading of 47.2 kg/day of suspended sediments.

Storm sewer discharges are not monitored on a regular basis. Pollutants contained in urban runoff include debris and contaminants from streets, contaminants from open land areas, air deposited substances, ice control chemicals and dirt and contaminants from vehicles. The "mix" of materials on street surfaces at any given location is a function of such factors as land use, geographical location, season, weather, traffic volume and character, local public works practices and so on. Loadings are very sporadic because of variation in precipitation intensity and duration. As there are no industries or institutions licensed to discharge wastes into these storm sewers (with the exception of Foothills Hospital), flow other than during storm events consiss mostly of groundwater infiltration into storm sewer and groundwater from construction sites.

There are 116 storm sewers which discharge into the Bow River itself. The Western Irrigation District Canal receives 20 outfalls between the diversion structure and Chestermere Lake.

The City of Calgary is also licensed by Alberta Environment to operate a winter snow disposal programme which includes deposition of snow at certain sites along the Bow River. No long lasting local effect on the Bow River from the springtime thawing of snow dumps has been demonstrated to dae, primarily because of the elevated river discharges at that time of the year. Although there have been some concerns about the immigration of heavy metals such as lead in groundwater. The primary considerations for the operation of the snow disposal programme are the insurance that the stream banks and vegetation are not physically damaged, that disposal sites do not present a hazard to the general public, and that they otherwise do not interfere with the public recreational use of the river valley.

E1.2.2 Existing Quality of Water

This discussion of existing water quality within the Calgary City limits is based on the following:

> for the Bow River, a set of twelve bacteriological samples collected in October, as well as chemical data collected at various intervals throughout 1978.

Measured values are compared to the "Alberta Surface Water Quality Objectives, 1977". The reader is referred to that publication for a discussion of the application and significance of those objectives.

Long term historical data for the quality of Bow River water coming into Calgary shows a high quality of water in all respects.

Major anious and cations, measurements of conductivity, total dissolved solids and suspended solids, as well as nutrient parameters are approximately the same as for the relatively undisturbed Elbow River, and no values exceed the provincial objectives. Except for the occastions where unusually large stormwater discharges may occur, and for those sites within the mixing zones of licensed industrial outfalls, the Bow River is of the same good quality until points below the bridge on Ogden Road, S.E. Thereafter, both the Bonnybrook and Fish Creek sewage treatment plant effluents on the right hand side of the river (looking downstream) cause the levels of bacteria, phosphorous and nitrogen to rise above provincial objectives. Phosphorous concentrations six times, and nitrogen concentrations four times the provincial objectives have been observed during the 1978 open water season. Although much remains to be understood about nutrient cycling, concentrations of these parameters stay elevated all down the Bow River and into the South Saskatchewan River. The impact of the large point sources of phosphorous to the Bow and other river systems is a subject of study by Alberta Environment. The Department of the Environment will embark on a study in 1979 which will demonstrate whether advanced sewage treatment for cities like Calgary is justified.

A recent phosphorous input inventory showed that approximately 75% of all the phosphorous reaching the Bow River from headwaters to mouth, came from the two existing Calgary sewage treatment plants. The immediate effect on these discharges is easily recognizable within the City of Calgary. Above the Bonnybrook outfall there is no significant growth of rooted aquatic plants, while within the discharge plume and subsequently from bank to bank when the effluent and river are mixed, a thriving aquatic weed community exists. Measurements of standing crop in August of 1978 indicated a peak of approximately 44 tons of weeds on the bottom of a 1 km reach of river.

There are a variety of problems associated with that level of growth below the City of Calgary, but within the City limits the only impact problem besides aesthetics is with the river's dissolved oxygen levels. Plants give off oxygen during the day and consume it at night, and such dense growths result in excessively high daytime dissolved oxygen levels and excessively low nightime levels. The provincial objective for dissolved oxygen in water is a minimum of 5 mg/l. Early morning dissolved oxygen concentration in the summer of 1977 and 1978 have been measured to be as low as 3.9 mg/l, a level considered to be excessively low.

Other biological observations and experimentation have shown that the nutrient loadings to the Bow River within the City of Calgary are the primary changers of the quality of the Bow River.

Finally, the results of the October 30, 1978 bacteriological samplings are shown below. Values are based on single samples and an asterisk indicates where water is unsuitable for primary contact recreation. The units are numbers of bacteria per 100 ml.

SITE	TOTAL COLIFORMS	FAECAL COLIFORMS	SUITABILITY
85th Street, left bank	17	13	
85th Street, right bank	350	170	
Centre Street, left bank	33	7.8	
Centre Street, right bank	49	11	
Ogden Road, left bank	240	79	
Ogden Road, right bank	130	33	
Glenmore Trail, left bank	1600	79	borderline
Glenmore Trail, right bank	2400+	2400+	*
Conmac site, left bank	2400+	540	*
Conmac site, right bank	2400+	1600	*
Highway 22, left bank	2400+	1600	*
Highway 22, right bank	2400+	2400+	*

E1.2.3 Past Quality of Water

Briefly, the trend in water quality during the 1950's and 1960's was one of progressive deterioration because of the increased volume and variety of wastewaters. During the present decade, however, a number of improvements are noteworthy.

The most active control of industrial discharges has been since the formation of the Provincial Environment Department. A combination of more stringent regulations imposed by its agencies and the development of affordable pollution abatement technology within the individual industries, has seen the annual loading of water contaminants decrease. New wastewater effluent guidelines for Alberta petroleum refineries and Alberta fertilizer plants were established in 1976. These guidelines cover the two most important continuous discharge industries within the City of Calgary. Moreover, some discharges have been eliminated altogether, such as that of the Imperial Oil Refinery.

Similarly, municipal wastewater treatment has improved. Until 1970 Calgary provided only primary treatment using three sewage treatment plants located at Bonnybrook, Ogden and Fish Creek. 1971 was the first full year of operation of the secondary activate sludge sewage treatment facility at Bonnybrook, and B.O.D. loadings in that year were reduced by 75%. This ended a previous worry about possible oxygen depletion below Calgary under ice cover. In 1975 the Ogden Plant was shutdown and flows diverted to Fish Creek which still provides primary treatment. A secondary treatment plant is presently under construction however.

E1.2.4 Potential Future Sources of Pollutants and Outlook for the Future

E1.2.4.1 Industrial Effluents:

Industrial effluents should be of lesser quantity and better quality as time progresses. Continual review of license conditions with a view to developing more stringent regulations on the part of government, as well as development of pollution abatement technology in the private sector will achieve those results. Advances are expected to be made in the areas of treatment techniques and more efficient water re-use within the plants. In some cases alternative disposal mechanisms such as land application may be considered if conditions are right.

New industry location within Calgary or expansion of existing industries, is another way in which overall effluent discharge patterns could change.

E1.2.4.2 Municipal Effluents:

The Fish Creek secondary sewage treatment facility, to be completed in 1979 will greatly reduce suspended solid and BOD loadings to the Bow River. As discussed previously the potential exists for making further improvements on the quality of the Bow River by reducing the phosphorous content of municipal effluents. Should the potential be proven to be real and if it is deemed to be ffordable as well as have significant benefits, real water quality improvement will result. If conversely, the opposite is shown, it is reasonable to assume that the status quo in water quality will be maintained.

It should be pointed out that the cost of nutrient removal is of prime consideration in its justification. Although initial equipment installation costs may not be particlarly great, chemical costs can run into the millions annually, and greater volumes of a different type of sludge must be handled. Just as the problems associated with sewage treatment and discharge are created by growing the human population solutions to those problems must be paid for by the taxpayer'

Reliable estimate of the cost of advanced wastewater treatment in Calgary are not yet available, however, the City and the Province are working closely together to get such estimates as soon as possible.

E1.2.4.3 Urban Runoff:

As the City expands in area and more land is changed to an urban environment, more urban runoff will result. In the absence of treatment this changing runoff will continue to gradually degrade the streams which receive them.

The most utilized mode of stormwater treatment is the settling out of particles in retention facilities. Currently there are major retention facilities which receive water from a large tank system and other facilities largely associated with golf courses and public parks in the City. More retention facilities are planned for the future.

In addition, approximately 40% of major storm sewer outfalls have traps which are designed to collect both debris and oil, and the City has a continuing program of installing such traps.

E1.3 THE ELBOW RIVER

E1.3.1 Existing Sources and Types of Pollutants

There are no municipal or industrial effluents continually discharged into the Elbow River which receives only stream runoff.

Storm sewer discharges are not monitored on a regular basis. Pollutants contained in urban runoff include debris and contaminants from streets, contaminants from open land areas, air deposited substances, ice control chemicals and dirt and contaminants from vehicles. The "mix" of materials on street surfaces at any given location is a function of such factors as land use, geographical location, reason, weather, traffic volume and character, local public works practices, and so on. Loadings are very sporadic because of variation in precipitation intensity and duration. As there are no industries or institutions licensed to discharge wastes into these storm sewers, flow other than during storm events consists mostly of groundwater infiltration into storm sewers and groundwater from construction sites.

As there are 24 storm sewers which discharge into Glenmore Reservoir, the City of Calgary performs periodic analyses to ensure that drinking water standards for heavy metals, boicides, and oil and grease are not exceeded in the main raw water supply. In addition, 75 storm sewers empty into the Elbow River below Glenmore Reservoir.

E1.3.2 Existing Quality of Water:

This discussion of existing water quality within the Calgary City limits is based on the following:

- for the Elbow River near its mouth, nutrient and major ion data collected by the Water Quality Control Branch from June through October, 1978.
- for the Elbow River near its mouth, single bacteriological samples collected in October, 1978.

Measured values are compared to the "Alberta Surface Water Quality Objectives, 1977". The reader is referred to that publication and significance of those objectives.

The Elbow River, because it receives the least amount of any kind of waste water, is subject to the least amount of deterioration within the Calgary city limits. Values for all parameters are in the range typical for foothills streams in the Calgary Region, nutrients do not exceed Alberta surface water quality objectives, and bacteriologically the river appears to be suitable for primary contact recreation. Mean total phosphorous concentrations are 0.009 mg/l, mean total dissolved nitrogen concentrations are 0.25 mg/l and specific conductrance is in the neighbourhood of 350 umho/cm near the mouth.

E1.3.3 Past Quality of Water

Briefly, the trend in water quality during the 1950's and 1960's was one of progressive deterioration because of the increased volume and variety of waste waters. During the present decade however, a number of improvements are noteworthy.

The most active control of industrial discharges has been since the formation of the provincial Environment Department. A combination of more stringent regulations imposed by its agencies and the development of affordable pollution abatement technology within the individual industries has seen the annual loading of water contaminants decrease.

E1.3.4 Potential Future Sources of Pollutants and Outlook for the Future

E1.3.4.1 Industrial Effluents

Continual review of license conditions with a view to developing more stringent regulations on the part of government, as well as development of pollution abatement technology in the private sector will achieve those results. Advances are expected to be made in the areas of treatment techniques and more efficient water re-use within the plants. In some cases alternative disposal mechanisms such as land application may be considered if conditions are right.

New industry location within Calgary or expansion of existing industries is another way in which overall effluent discharge patterns could change.

E1.3.4.2 Municipal Effluents

With respect to municipal effluents it should be noted that the cost of nutrient removal is of prime consideration in its justification. As mentioned earlier the Elbow River receives the least amount of any kind of wastewater, and therefore it is subject to the least amount of deterioration within the City limits.

E1.3.4.3 Urban Runoff

As the City of Calgary expands in area and more land is changed to an urban environment, more runoff will result. In the absence of treatment this changing runoff will continue to gradually degrade the streams which receive them.

The most utilized mode of storm water treatment is the settling out of particles in retention facilities. Currently there is a major retention facility in northeast Calgary near the airport which receives water from a large trunk system, as well as a number of other retention ponds, largely associated with golf courses and parks in the City. More retention facilities are planned for the future.

In addition, the outfalls of major storm sewers have had traps installed which are designed to collect both large debris and oil. Approximately 40% of the outfalls have these traps, and the City has a continuing program of installation.

E1.4 NOSE CREEK AND WEST NOSE CREEKS

E1.4.1 Existing Sources and Types of Pollutants

There are no municipal or industrial effluents continually discharged it into any of these streams which receive only storm runoff.

E1.4.2 Existing Quality of Water

This discussion of existing water quality within the Calgary City limits is based on the following:

- for Nose Creek and West Nose Creek above the mouth of West Nose Creek, single samples collected October, 1978.

Measures values are compared to the "Alberta Surface Water Quality Objectives, 1977". The reader is referred to the above publication for a discussion of the application and significance of those objectives.

E1.4.2.1 West Nose Creek:

This creek is spring fed, but because its discharge is too low and the fact that it moves slowly through what is primarily rural pastureland, its quality is somewhat impaired. The nitrogen concentration observed in October, 1978 was less than the provincial objective, however, the phosphorus objective of 0.05 mg/l (total P) was not met. Condictivity was 907 umho/cm, and total dissolved solids were 578 mg/1, indications of a less pure water than that observed in the Elbow River. In addition, total coliform bacteria exceeded 2400 per 100 ml, a level which is unsuitable for primary contact recreation.

E1.4.2.2 Nose Creek:

Nose Creek near its mouth has a mean phosphorus and nitrogen concentration which exceeds the provincial objective for those parameters by three and two times respectively. Further upstream above the mouth of West Nose Creek, the phosphorus concentration in particular is much lower, but nitrogen levels already exceed the criteria. Levels of all major ions and the total dissolved solids are only slightly elevated at the mouth compared to above West Nose Creek. Total suspended solids, however, are much higher, and since West Nose Creek itself does not appear to contribute these suspended solids, it is highly likely that the source of the additional particulate material is the storm sewers which discharge into lower Nose Creek. The large amounts of phosphorus found near the mouth are associated with this particular material. In addition, the total coliform count for Nose Creek near its mouth was found to be greater than 2400 per 100 ml, making it unsuitable for primary contact recreation. The fecal coliform count is 130 per 100 ml.

In summary, both West Nose Creek and Nose Creek at the City of Calgary outskirts appear to be of marginal quality, and Nose Creek receives further deterioration within the lower reach where storm water input occurs.

E1.4.3 Past Quality of Water

The trend in water quality in Nose Creek is difficult to define because of the scant monitoring record. It is reasonable to assume that Nose Creek water quality has deteriorated with increasing urban development within its basin. In addition, certain portions of the lower Nose Creek valley have been physically neglected and are sites for unsightly build up of waterborne and otherwise discarded refuse. The degree of that problem has also likely been proportional to urban encroachment on the stream.

West Nose Creek and its water quality has likely evolved with agricultural activity in that basin. Those types of changes in land use bring about very gradual changes in water quality that cannot be adequately evaluated as part of this type of a discussion.

E1.4.4 Potential Future Sources of Pollutants and Outlook for the Future

E1.4.4.1 Industrial Effluents:

Although there are no industrial effluents discharged into the Creeks as a guide for the future, these types of effluents should be of lesser quantity and better quality as time progreses. Continuous reviews of license conditions with a view to developing more strigent regulations on the part of government, as well as development of pollution abatement technology in the private sector will achieve those results. Adances are expected to be made in the areas of treatment technique and more efficient water re-use within the plants. In some cases alternative disposal mechanisms such as land application may be considered if conditions are right.

New industry location within the City of Calgary or expansion of existing industries, is another way in which overall effluent discharge patterns could change.

E1.4.4.2 Municipal Effluents:

Presently there are no municipal effluents discharged into these creeks. However, as mentioned earlier in the case of the Bow River, the potential exists for making further improvements to the quality of all water courses within the City limits, by reducing the phosphorus content of municipal effluents.

E1.4.4.3 Urban Runoff:

As the City of Calgary expands in area more land is changed to an urban environment and more runoff results. In the absence of treatment this changing runoff will continue to gradually degrade the streams which receive them.

Concerning the most utilized modes of storm water treatment and installation of major storm sewers with traps for collecting debris and oil, the reader is referred to the Water Use Sections of the Bow and Elbow Rivers.

E2 WATER FLOW LEVELS

The following information pertaining to flow fluctuations on the Elbow River, has been provided by the Planning Division of the Alberta Department of the Environment. Any specific questions arising from the following discussion should be directed to the Department of the Environment.

E2.1 General

A cursory examination has been made of the flow fluctuations in the Bow and Elbow Rivers and Nose and Beddington Creeks. The analysis of flow variations was based largely on the examination of continuous water level recorder charts supplied by Water Survey of Canada for the period January to October 1978 at hydrometric stations on the Bow River at Langevin Bridge, Elbow River below Glenmore Dam, and Nose Creek near the mouth. A hydrometric station does not exist on Beddington Creek. In addition, historical monthly data as published by Water Survey of Canada was received to identify typical mean monthly variations. No attempt was made to describe typical annual variations. Such an analysis would require a statistical treatment of the data which was considered to be beyond the scope of this study. It suffices to say that although there is some evidence of flow persistence from year to year, the annual variations are largely random events subject to the vagaries of annual meteorologic events.

To determine as much information as possible on the cause and effect of relationships inherent in the flow fluctuations, discussions were held with the City of Calgary Waterworks Division and the Water Rights and Flow Forecasting Branches of Alberta Environment.

It was stressed that only general trends or variations were identified and no attempt was made to describe variations in terms of specific statistical parameters that might be considered more useful for design purposes.

E2.2 The Bow River

Flow fluctuations on the Bow River through Calgary are affected primarily by the operation of the Calgary Power Reservoir with hourly flctuations dependent primarily on the operation of the Bearspaw Reservoir. Super-imposed on the releases are the flows in the Elbow River and Nose Creek, storm runoff from within the City, sewage releases from the Fish Creek and Bonnybrook sewage treatment plants and diversions to the Western Irrigation District Canal. Considering that the mean annual flow of the Bow River through Calgary is approximately ten times the combined flow of the Elbow River and Nose Creek, and that sewage releases (in the order of 3.4 m^3/s (120 cfs) and diversions to the WID canal (in the order of 9 m^3/s (340 cfs) during April to September are fairly constant, flow fluctuations are influenced primarily by upstream operations.

During the spring and summer the daily and monthly variations generally reflect the variations in natural runoff that occur upstream on the Bow River system. During the spring there can be considerable dampening of the snowelt flood peak as depleted reservoir storage is regained but there is little control effected during summer rainstorms.

The largest change in mean monthly water level occurs between June and July. On the average the mean monthly stage during July is approximately 0.46 m (1.5 ft.) higher than during June. Successive mean daily water levels are generally within 0.06 m (0.2 ft) of each other although variations of up to 0.15 m (0.5 ft) have occurred occasionally in response to rainfall. Generally, over a weekly period the variations occur in a progressive descending or ascending manner.

Hourly variations in water level on the Bow River are largely the direct result of operations at Calgary Power's Ghost and Bearspaw hydro-electric plants. At the Ghost plant, releases typically vary from a minimum of 2.8 m^3/s (100 cfs) in offpeak periods (generally from 100 to 800 hrs) to a plant capacity of 198 m^3/s (7,000 cfs). The Bearspaw Resrvoir then follows an operation that evenly distributes the mean daily flow released from the Ghost Plant. Generally, the releases from the Bearspaw Reservoir over the day are uniformly progressive with hourly variations in stage in the order of 0.02 m (0.05 ft.). Occasionally during an hour period the water level has fluctuated by up to 0.15 m (0.5 ft.).

In general, the Calgary Power operations from a day to day basis do not produce consistent variations in stage on the Bow River through Calgary. Releases depend on the natural inflow to the reservoir, power demand and the frequency of unscheduled maintenance at the thermal plants (power supply picked up by hydro). However, from a month to month basis the operation is more consistent with one of the major impacts coming during the October to March period when the flow through Calgary is augmented by an additional 20 to 28 m^3/s (700 to 1,000 cfs).

A summary of discharge data for the Bow River is shown in the following table.

DISCHARGE SUMMARY

	April to September		October to March		Average Annual Instantaneous	
	Mean Montly Discharge		Mean Monthly Discharge		Peak Discharge	
	m^3/s	cfs	m^3/s	cfs	m^3/s	cfs
Bow River	123.0	4,330	54.7	1,930	336.3	11,870
	(0.34m)	(1.1 ft.)	(0.00m)	(0.0)	(1.01m)	(3.3 ft.)

NOTE: Stage based on assumed datum is shown in brackets below the appropriate discharge. Means based on period 1970 - 1977.

E2.3 The Elbow River

Fluctuations on the Elbow River through the city of Calgary are influenced primarily by the operation of Glenmore Reservoir. In response to spring runoff the mean monthly release is gradually increased during the April to June period with the highest mean monthly flow occurring during June. The mean monthly flow shows a gradual decrease through the summer and on into fall. During the April to August period the average change from month to month is approximately 0.15 m (0.5 ft.) while mean monthly flows during the fall and winter months are fairly constant.

Mean daily flows are also generally constant through the late fall and winter period and in recent years have been only slightly more than the riparian release of 0.5m^3/s (15 cfs). During the spring and summer, mean daily flows tend to reflect the natural daily variations of inflow to Glenmore Reservoir. Fluctuations in mean daily water levels are generally less than 0.08 m (0.25 ft.) with occasional fluctuations of up to 0.15 m (0.5 ft.).

Hourly variations in water level occur as a result of coordinated operations at the Glenmore Dam and the water treatment plant situated near the reservoir. Three turbine pumps at the dam can be used to pump water from the reservoir to the treatment plant. During the winter, water is released through the turbines during peak electrical demand periods to pump water to the treatment plant. Consequently, during the evening an increase in stage of up to 0.30 m (1.0 ft.) can occur. During the summer months the pumps are generally run on a continuous basis. Throughout the year minor fluctuations in the order of 0.03 m (0.1 ft.) occur from hour to hour as the result of 'backwash' releases from the water treatment plant. These releases generally constitute about three per cent of the volume of the daily withdrawl from the reservoir and have a frequency of recurrence of three to four hours in the winter to every hour in the summer.

DISCHARGE SUMMARY

	April to September Mean Monthly Discharge		October to March Mean Monthly Discharge		Average Annual Instantaneous Peak	
	m^3/s	cfs	m^3/s	cfs	m^3/s	cfs
Elbow River	7.9	280	1.1	40	52.1	1,840
	(0.37 m)	(1.2 ft.)	(0.00)	(0.0)	(1.10 m)	(3.6 ft.)

Note: Stage based on assumed datum is shown in brackets below appropriate discharge.

Means based on period 1970 - 1977.

E2.4 Nose Creek

Nose Creek enters the Bow River just below St. George's Island. Continuous water level records have been recorded since 1972 and since that time the highest mean monthly flow has occurred in April in response to the spring snowmelt. Day to day variantions in water level apparently occur in direct response to runoff from the Nose Creek basin. After the sping snowmelt the mean monthly flow gradually decreases and by late summer the flows might be very near zero. There are a few low level weirs situated on the creek but no major structures that can be used to control water flow.

E2.5 West Nose Creek

West Nose Creek is a tributary to Nose Creek and is subject to the same fluctuations imposed by natural runoff. However, no stream flow records have been maintained for West Nose Creek to verify the specific nature of the fluctuations. With respect to any further information regarding water flow levels, the reader should contact the Planning Division of the Alberta Department of the Environment.

E3 DIVERSIONS: THE BOW AND ELBOW RIVERS, NOSE AND WEST NOSE CREEKS

All the existing diversions are as shown on the "Active Water Right Projects and Permits" maps. Any further information regarding the user quantity and the actual use of water related to these permits and locations can be obtained from the Water Resources Division of the Alberta Department of the Environment.

F HISTORICAL SITES

F1 Archaeological Sites

With reference to the information dated July 6, 1978, received from the Archaeological Survey Branch of the Alberta Culture Department, there are 12 archaeological sites located approximately 500 ft. from either side of the Bow River and 4 sites along the Elbow River; 16 sites adjacent to Nose Creek and 6 site are located along West Nose Creek which must be further studied, (general areas are shown on the Environmental Inventory Map).

As indicated by the Archaeological Survey Branch, some of these sites may be of a minimal archaeological value. It should be noted, however, that all these areas are subject to a further close examination; and therefore, before any development takes place within these general areas, landowners/developers affected must consult with the Archaeological Survey Branch of the Alberta Culture Department.

F2 Heritage Sites - Bow and Elbow Rivers

Heritage sites which are located adjacent to the Bow and Elbow Rivers, are shown on the Environmental Inventory Map. The following sites are either designated by the Province of Alberta or listed as potential heritage sites by the City of Calgary.

The heritage sites are categorized as follows:

F2.1 Bow River:

T. Edworthy house
Alfred McKay house
Pumphouse #2 (Pumphouse Theatre)
Firehall #6
Ross Block
Irwin Block
Glenwood Manor
Danegal Mansion
Centre Street Bridge - built in 1916
A.E. Cross house
Major Stewart house
Colonel Walker house

F2.2 Elbow River:

Fort Calgary
R.B. Deane house
Hunt house
C.N. Station (St. Mary's Hall)
Sacred Heart Convent
St. Martin de Porres School (St. Mary's Girls' School)
Rivermead Apartments
Strand Apartments
William Aberhart's house
Millican residence (presently the Anglican diocese)

F2.3 Provincial-Designated Historic Sites

a. Provincial Historic Resource

- privately owned site
- privately owned site judged to be of major importance to Alberta's heritage

b. Provincial Historic Resource

- Crown owned
- a site which is wholly situated on Crown land ad deemed to be of major importance to Alberta's heritage

c. Registered Historic Resource

- privately owned
- privately owned site judged to be of regional significance

F2.4 City of Calgary - Potential Heritage Sites

Those buildings and sites which may be of historical and/or architectural value to the Calgary community.

a. - those sites or buildings, publicly or privately owned, which are felt to be of major histrical/architectural sinificance to the Calgary community.

b. - those sites or buildings, pubicly or privately owned which are felt to be o some historical/architectural significance to the Calgary community.

c. - those sites or buildings, publicly or privately owned, which are worthy of note in the historial/architectural development of the Calgary Community.

NOTE: A Provincial Historic Resource is designated by Ministerial Order and the site is eligible to receive a grant to a maximm of $75,000 over the first year for preservation or improvements made to the site. Once a site is desinated as a Provincial Heritage Resource it may not be destroyed, altered, restored, repaired, disturbed or changed without written consent of the Minister of Culture.

A Registered Historic Resource is designated by the Minister of Culture and the site is eligible to receive a grant to a maximum of $25,000 over a five year period for preservation or improvements made to the site. Upon registration, no person may destroy, alter, restore, repair, disturb or change a Registered Historic Resource until 30 days have elapsed. From the date of serving notice on the Minister or the Executive Director or the proposed landowner, or the Minister consents to such action. A potential heritage site is any site or building which may, following an architectural and historic reivew, prove to be of heritage merit to the City of Calgary. The actual designation of the site will be the responsibility of an appointed Heritage Advisory Board and City Council.

If any further information is required regarding heritage sites, the Special Projects Division of the City of Calgary Planning Department should be contacted.